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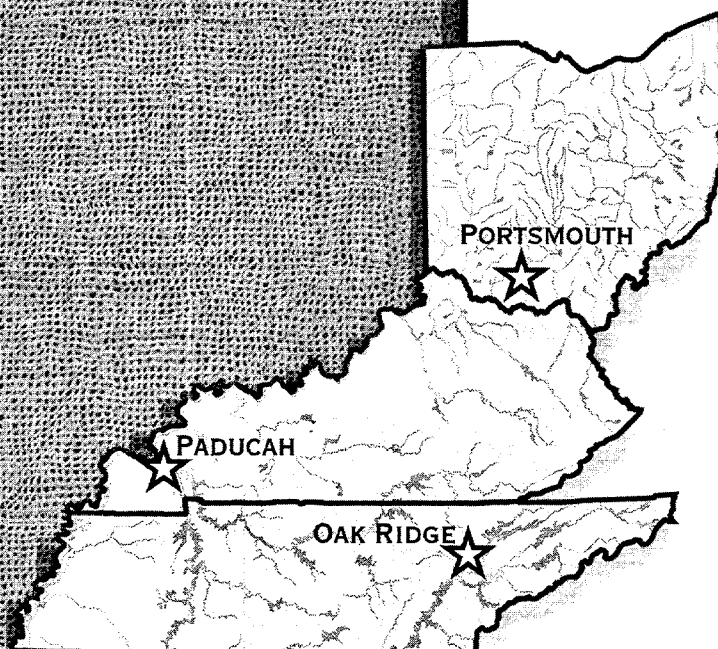
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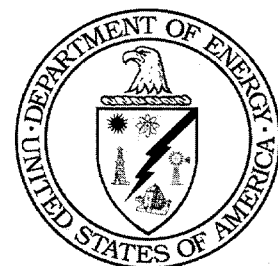
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ENVIRONMENTAL MANAGEMENT
& ENRICHMENT FACILITIES
MANAGEMENT AND INTEGRATION CONTRACT

**Waste Acceptance Criteria
for the Department of Energy
Treatment, Storage, and Disposal Units
at the Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**



H-00015-1322



MANAGED BY
BECHTEL JACOBS COMPANY, LLC
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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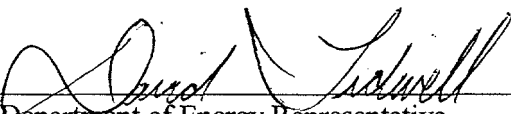
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Prepared for the
U.S. Department of Energy
Office of Environmental Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
East Tennessee Technology Park
Oak Ridge Y-12 Plant Oak Ridge National Laboratory
Paducah Gaseous Diffusion Plant Portsmouth Gaseous Diffusion Plant
under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

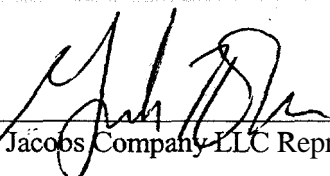
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for the Department of Energy
Treatment, Storage, and Disposal Units
at the Paducah Gaseous Diffusion Plant,
Paducah, Kentucky



U.S. Department of Energy Representative

1/15/03
Date



Bechtel Jacobs Company LLC Representative

1/15/03
Date



United States Enrichment Corporation Representative

1/31/03
Date



WESKEM, LLC Representative

1/15/03
Date

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ABBREVIATIONS AND ACRONYMS

ACM	asbestos containing material
AD	Accumulation (Start) Date
Am	Americium
BJC	Bechtel Jacobs Company LLC
Bq	Becquerel
CFR	Code of Federal Regulations
Ci	Curie
CoC	contaminants of concern
COC	Chain of Custody
DOE	U. S. Department Of Energy
DOT	U. S. Department Of Transportation
DTPA	Diethylenetriamine pentaacetic acid
DTS	Date To Storage
DQO	Data Quality Objective
EDTA	Ethylenediamine tetraacetic Acid
EPA	U. S. Environmental Protection Agency
ESH	Environmental, Safety and Health Organization
E&ES	Engineering and Environmental Services
FFCA	Federal Facilities Compliance Agreement
FM	Factory Mutual Insurance Company
GD	Generation Date
HP	Health Physics
ICP	Inductively Coupled Plasma
HAUP	High Assay Upgrade Project
KAR	Kentucky Administrative Regulations
KDWM	Kentucky Division of Waste Management
KPDES	Kentucky Pollutant Discharge Elimination System
LDR	Land Disposal Restriction
LLW	Low-Level (Radioactive) Waste
MSDS	Material Safety Data Sheet
NARM	Naturally-Occurring and Accelerator-Produced Radioactive Material
NCS	Nuclear Criticality Safety
NCSA	Nuclear Criticality Safety Approval
NDA	Non-Destructive Assay
Np	Neptunium
NTS	Nevada Test Site
OREIS	Oak Ridge Operations Office Environmental Information System
PCB	Polychlorinated Biphenyl
pCi	picoCurie
PGDP	Paducah Gaseous Diffusion Plant
PK	Process Knowledge
Ppb	parts per billion
PPE	Personal Protective Equipment
ppm	parts per million
Pu	Plutonium
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFD	Request for Disposal/Storage of Waste Materials and Equipment Form

SAP	Sampling and Analysis Plan
STR	Subcontract Technical Representative
Tc	Technetium
TCLP	Toxicity Characteristic Leaching Procedure
Th	Thorium
TID	tamper-indicating device
TIMS	Thermal Ionization Mass Spectrometry
TRU	Transuranic Waste
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
U	Uranium
UE	Uranium Enrichment
UL	Underwriter's Laboratories
UHC	Underlying Hazardous Constituent
USEC	United States Enrichment Corporation
UTS	Universal Treatment Standard
VOA	Volatile Organic Analyses
VOC	Volatile Organic Compounds
WAC	Waste Acceptance Criteria
WGP	Waste Generation Plan
WICL	Waste Item Container Log
WMP	Waste Management Plan
WOS	Waste Operations Subcontract

DEFINITIONS

Accumulation Start Date - for Resource Conservation and Recovery Act (RCRA) waste, the date accumulation of hazardous waste begins. For waste originating from a satellite accumulation area, the accumulation date is the date an excess accumulation begins (i.e., greater than 55-gal hazardous waste or 1 quart of acutely hazardous waste), or it is the date the waste goes into a 90-day area or permitted storage facility. (401 KAR 32:030 Section)

Asbestos Containing Material (ACM) - any material which contains more than one percent asbestos.

Asbestos Containing Waste - any waste material that contains asbestos. Examples include discarded asbestos containing material and waste from an asbestos abatement project, such as personal protective equipment (PPE), filters, enclosure plastic, etc.

Becquerel (Bq) - a unit of measure of the rate of radioactive decay. One Becquerel (Bq) is the quantity of any radioactive nuclide which undergoes one disintegration per second.

Beryllium Waste - any waste material that contains elemental beryllium and any insoluble beryllium compound or alloy in concentrations of 0.1% beryllium or greater that may be released as an airborne particulate,

By-product Material - waste material which meets either of the following definitions:

a. Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident or to the process of producing or utilizing special nuclear material. For purposes of determining the applicability of the Resource Conservation and Recovery Act to any radioactive waste, the term "any radioactive material" refers only to the actual radionuclides dispersed or suspended in the waste substance. The nonradioactive hazardous waste component of the waste substance will be subject to regulation under the Resource Conservation and Recovery Act.

b. The tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. Ore bodies depleted by uranium solution extraction operations and which remain underground do not constitute "byproduct material." (DOE Order 435.1)

Certified Waste - material that has been confirmed to comply with applicable acceptance criteria under an approved certification program (DOE Order 435.1)

Chelating Agent - an agent which mobilizes fixed heavy metals and radionuclides for migration in the environment. Decontamination solutions often include chelating agents. Examples include amine polycarboxylic acids (EDTA, DTPA), hydroxy-carboxylic acids, and polycarboxylic acids (citric acid, gluconic acid).

Class C Radioactive Waste - One of the three categories of LLW (Classes A, B, and C) which are distinguished by the types of radionuclides they contain. Greater-than-Class C is defined by reference to the Class C wastes whose radionuclide concentrations are exceeded. At PGDP, the only Class C radionuclide, which occurs in discernible quantity, is ⁹⁹Tc for which the Class C threshold quantity is 3 Ci per cubic meter per volume of waste. (10 CFR 61)

Classified Material - any item or scrap which due to its composition, structure, or function, reveals restricted data or other classified information, either directly or through analysis, in accordance with DOE CG-SS-3 and DOE CG-PGD-5.

Contaminants of Concern (CoC)- Those regulated contaminants that have the potential to be present in a waste stream.

Data Quality Objectives (DQOs) - a set of criteria established for the collection of data to ensure that the data is adequate to make the required decision. For waste characterization, the data quality objectives will include the analyses required, the analytes (the contaminants of concern), the type and number of samples, the quality control samples and analyses; and the degree of confidence required.

Date-to-Storage (DTS) - the date that the first polychlorinated biphenyl (PCBs) are placed in a container or the PCB item is removed from service for disposal (whichever is first). This date is placed on the container or the item by the generator. (40 CFR 761)

Debris – for RCRA a solid material exceeding a 60 mm particle size that is intended for disposal and that is; a manufactured object; or plant or animal matter; or natural geologic material. (40 CFR 268.2(g))

Disposal - the intentional or unintentional discharge, discard, or abandonment of a waste material with no intent of future use or removal.

Environmental Media – soil, groundwater, surface water, and sediments.

Etiologic Agent - a viable microorganism, or its toxin, that causes or may cause disease in humans or animals. Etiologic agents include those agents listed in 42 CFR 72.3 of the regulations of the Department of Health and Human Services and any other agent that causes or may cause severe, disabling or fatal disease. The terms infectious substance and etiologic agent are synonymous.

Facility - a building or operational unit.

Fissionable Material - any material in which a self-sustaining, neutron-induced fission chain reaction can occur. Nearly all the fissions in such a chain reaction are of the fissionable nuclides (e.g. ^{233}U , ^{235}U , or ^{239}Pu) contained in the fissionable material.

Free Liquids - liquids which readily separate from the solid portion of a waste under ambient temperature and pressure. The presence or absence of free liquids is determined by the paint filter test. See Paint Filter Test. (40 I KAR Chapter 47:005)

Generation Date - the date that the waste item was generated and/or declared a waste. For bulking operations, the origin date for the newly generated waste (the bulked waste) will be the earliest origin date noted for any of the wastes bulked.

Generator - see Waste Generator.

Greater-than-Class C Radioactive Waste - see Class C Radioactive Waste.

Hazardous Waste - see RCRA hazardous waste.

High Level Radioactive Waste - highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid that contains a combination of transuranic waste (TRU) and fission products in concentrations requiring permanent isolation (DOE Order 435.1). No high level radioactive waste, by this definition, is generated at Paducah.

Laboratory Packs - a combination package with inner containers, absorbents, and configuration as specified in DOT regulations. (49 CFR 173.12(b))

Land Disposal Restrictions (LDR) - provisions of the Hazardous and Solid Waste Amendments that prohibits the land disposal of hazardous waste into or on the land unless the U. S. Environmental Protection Agency (EPA) finds that it will not endanger human health and the environment. EPA specifies levels or methods of treatment that substantially diminish the toxicity of the waste or the likelihood that hazardous constituents will migrate from the waste that must be met before the waste is land disposed. (40 CFR 268)

Landfill Waste - waste that is not RCRA hazardous, Toxic Substances Control Act (TSCA), or radioactive waste. This waste category generally includes such materials as asbestos, garbage, refuse, rubbish, paper, wood, nominal amounts of metal, construction materials, demolition materials, and other materials as specified by the applicable landfill permit. (401 KAR 31)

Low Level Radioactive Waste (LLW) - waste that contains radioactivity but is not, by definition, high-level waste, transuranic waste, spent nuclear fuel, or byproduct material as defined by DOE Order 435.1. Low-level waste does not contain hazardous waste as defined in 40 CFR 261 or materials regulated as defined in 40 CFR 761.

Mixed Waste - waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the RCRA, respectively. (DOE Order 435.1)

Naturally Occurring and Accelerator Produced Radioactive Material (NARM) - any radioactive material that can be considered naturally occurring and is not source, special nuclear, or byproduct material or that is produced in a charged particle accelerator. (DOE Order 435.1)

Nuclear Criticality Safety Category 1 Drums - Material containing greater than or equal to 1.0 weight percent of ^{235}U and 15 or more grams ^{235}U , but containing less than or equal to 650 grams of ^{235}U if in a 55-gallon drum or containing less than or equal to 375 grams of ^{235}U if in a 30-gallon drum. The contents of this container shall not be consolidated unless approved by NCS.

Nuclear Criticality Safety Category 2 Drums - Material containing greater than 1.0 weight percent of ^{235}U , and containing greater than 650 grams but less than or equal to 1500 grams of ^{235}U if in a 55-gallon drum or containing greater than 375 grams but less than or equal to 1500 grams of ^{235}U if in a 30-gallon drum. The contents of this container shall not be consolidated unless approved by NCS.

Nuclear Criticality Safety Spacing Exempt Waste - Material containing equal to or greater than 1 weight percent of ^{235}U and < 15 grams of ^{235}U .

Nuclear Criticality Safety Exempt Waste - materials that require no NCS controls. Material containing less than 1.0 weight percent of ^{235}U , or has been exempted from NCS controls after review by waste operations and NCS.

Off-Site Transportation - the movement of DOT-regulated waste materials over roads accessible by the public (i.e., in commerce), including roads partially or completely on DOE property.

On-Site Transportation - the movement of DOT-regulated waste materials within the Paducah Gaseous Diffusion Plant (PGDP) security fence over roads which are not accessible by the public (i.e., not in commerce).

Origin Date - see generation date

Packing Group - DOT designation of container strength required to package hazardous materials (i.e. PGI or X, high hazard; PGII or Y, medium hazard; PGIII or Z, low hazard). See DOT 49 CFR 172.101(f) for packing group selection.

Paint Filter Test - an EPA-approved test to determine the presence or absence of free liquids to determine compliance with 40 CFR 264.3 13. (SW-846 Method 9095A)

PCB Detectable Waste - any item designated for disposal which contains PCBs in concentration greater than the lower level of detection in the waste matrix and less than 50 ppm. These items must not be contaminated from any PCB source of 50 ppm or greater in concentration unless exempted in 40 CFR 761.

PCB Radioactive Waste - TSCA-regulated waste that contains radioactive constituent(s) as defined by the Atomic Energy Act.

PCB Waste - any liquids or solids designated for disposal which contain PCBs in concentration of 50 ppm or greater or have been in contact with PCBs from sources of 50 ppm or greater in concentration, unless specifically exempt in 40 CFR 761.

PCB/RCRA Mixed Waste - RCRA mixed waste that is also PCB waste.

Process Knowledge - as it applies to waste certification, is documented knowledge of the processes and sources associated with generation of a waste or waste stream that allows a reliable estimation of the constituents and quantities for handling, storage, treatment, and disposal. Process knowledge is information, ultimately based on either analytical data or knowledge of the waste generating activity, that relates to the material to be characterized, but does not directly represent the material itself. Determinations made by process knowledge must be documented and re-certified on a periodic basis. (Form UCN20701)

Radioactive Waste - solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended and of negligible economic value considering costs of recovery.

RCRA Hazardous Waste - any solid, liquid, or contained gaseous material (compressed gas cylinder) which is characteristically hazardous or is a listed hazardous waste as defined by 401 KAR 31, and/or any environmental media that contains a listed hazardous waste.

RCRA Mixed Waste - see Mixed Waste.

Representative Sample - as defined by the EPA, a representative sample is a "sample of a universe or whole (for example, waste pile, lagoon, drummed liquid, or solid), which can be expected to exhibit the average properties of the universe or whole." Specific sampling techniques are outlined by EPA for obtaining representative samples. (SW-846)

Storage - the intentional or unintentional placement of wastes in an area from which retrieval is possible or intended.

Toxicity Characteristic Leaching Procedure (TCLP) - an EPA-approved method to determine the mobility of certain organic and inorganic analytes present in solid or liquid waste. (SW-846 Method 1311)

Transuranic Waste - without regard to source or form, transuranic waste (TRU) is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) High-level radioactive waste; (2) Waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) Waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

Treatment - any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste non-hazardous, or less hazardous; safer to transport, store, or dispose; or amenable for recovery, amenable for storage, or reduced in volume. (40 CFR 260.10)

Treatment, Storage, and Disposal Units (TSDs) - a building or operational unit where waste is treated, stored, or disposed.

TSCA Radioactive Waste - see PCB Radioactive Waste.

Underlying Hazardous Constituent (UHC) - any constituent listed in 40 CFR 268.48, Table UTS - Universal Treatment Standards, except fluoride, vanadium, and zinc, which can reasonably be expected to be present at the point of generation of the hazardous waste, at a concentration above the constituent-specific UTS. Underlying hazardous constituents must be identified on land disposal restriction notification unless the treater will monitor for all regulated constituents.

Waste - materials intended to be or which have actually been thrown away, abandoned, or destroyed; materials that have served their intended purpose and are sometimes discarded or recycled, such as waste solvents, paint wastes, waste acids, used drums, and used oil; and materials that are incidentally generated as part of a process.

Waste Acceptance Criteria (WAC) - requirements that each category of waste must meet to be accepted and managed by Waste Operations. Generators must certify that wastes meet the appropriate WAC before the waste can be transferred to Waste Operations.

Waste Category - groups of waste that are governed by common regulations (e.g., LLW, RCRA waste, PCB waste, etc.).

Waste Certification - the process of ensuring and attesting to the fact that a waste has been generated, containerized, and characterized in accordance with an approved Waste Generation Plan. To complete the certification, the generator must document by signature that the waste complies with the WAC applicable to that waste category.

Waste Characterization - the process of identifying and quantifying the chemical, physical, biological, and other properties of waste in a manner adequate to determine regulatory category or to meet WAC of the receiving organization.

Waste Container - any package, can, bottle, bag, barrel, drum, tank, or other device that contains waste. A waste article may also be the container.

Waste Generator - individual (such as Facility Manager, supervisor of a waste-generating activity, or appointee) or organization whose act or process produces waste to be managed for the DOE.

Waste Oil - used products primarily derived from petroleum, which include, but are not limited to, fuel oils, motor oils, gear oils, cutting oils, transmission fluids, hydraulic fluids, and dielectric fluids.

Waste Stream - waste material produced by a specific process or activity that is similar in material, physical form, radiological and chemical constituents.

EXECUTIVE SUMMARY

The U. S. Department of Energy (DOE) owns and operates waste treatment, storage, and disposal (TSD) units at the Paducah Gaseous Diffusion Plant (PGDP). Bechtel Jacobs Company LLC (BJC), the Management and Integration Contractor for the DOE manages these units and WESKEM, LLC (WESKEM), the waste operations services subcontractor to the BJC, operates them. Currently, TSD units include the C-746-U Solid Waste Landfill, several hazardous waste storage units, radioactive waste storage units, and three wastewater treatment units. These units may be regulated by the DOE, the Commonwealth of Kentucky, and/or the U.S. Environmental Protection Agency under the provisions of the Atomic Energy Act, the Resource Conservation and Recovery Act, the Toxic Substances Control Act, the Kentucky Solid Waste Landfill Regulations, and/or the Clean Water Act.

This document establishes the site specific criteria, in addition to the state, federal, and departmental criteria, which the various waste types must meet before being transferred to one of the PGDP TSD units. The established criteria ensures the wastes accepted for treatment, storage, and/or disposal at the various PGDP TSD units will be handled safely in compliance with all applicable regulations. Various contractors and subcontractors may generate waste at PGDP through general maintenance, environmental restoration projects, and daily plant process activities.

The waste management tracking and reporting system at PGDP is based on the generator's Request for Disposal (RFD). Before generating wastes, each generator is required to have their Waste Management Plan (WMP) and Waste Generation Plan (WGP) approved by BJC and WESKEM. These two documents provide BJC and WESKEM sufficient information to assess the generator's ability to effectively manage its waste and to determine if they have identified a suitable disposition path for each waste stream that is to be generated. The RFD is used to facilitate the transfer of waste to one of the various PGDP TSD units.

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1. INTRODUCTION

The U. S. Department of Energy (DOE) owns and operates waste treatment, storage, and disposal (TSD) units at the Paducah Gaseous Diffusion Plant (PGDP). Bechtel Jacobs Company LLC (BJC), the Management and Integration Contractor for the DOE at the PGDP manages these units, and WESKEM, LLC (WESKEM), the BJC's waste operations services subcontractor operates them. Currently, these units include the C-746-U Solid Waste Landfill, several hazardous waste storage units, radioactive waste storage units, and three wastewater treatment units. These units may be regulated by the DOE, the Commonwealth of Kentucky, and/or the U.S. Environmental Protection Agency (EPA) under the provisions of the Atomic Energy Act, the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), the Kentucky Solid Waste Landfill Regulations, and/or the Clean Water Act.

This document was developed to ensure that wastes accepted for treatment, storage, and/or disposal at the various TSD units are in compliance with the federal, state, and departmental rules and regulations governing their operation, and can be handled in a safe and efficient manner. The waste acceptance criteria established in this document applies to all newly generated waste being offered for treatment, storage, and/or disposal at a PGDP TSD unit. It does not apply to waste that will be sent directly to an off-site TSD from the point of generation or legacy waste accepted into storage under previous WAC and/or procedures. This document does not supersede applicable federal and state regulations. The generator is responsible for ensuring that all wastes are generated and managed in accordance with current best management practices and applicable federal, state, and department requirements.

The BJC Waste Disposition Project and WESKEM are available to assist you in understanding and interpreting the requirements in this document. For assistance please call:

BJC Waste Disposition Project Office:

Telephone: 270-441-5326

Fax: 270-441-5092

WESKEM LLC Waste Operations Office:

Telephone: 270-441-5218

Fax: 270-441-5225

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2. PURPOSE AND SCOPE

This document establishes the waste acceptance criteria for **PGDP** TSD units. The waste acceptance criteria provide the requirements, terms, and conditions under which waste will be accepted for treatment, storage, and/or disposal at **PGDP** TSD units. The criteria apply to all newly generated wastes that are being offered for treatment, storage, and/or disposal to any PGDP TSD unit.

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3. TRANSFER PROCESS

Figure 1 is a flow diagram that depicts the process of transferring waste to one of the PGDP TSD units. This diagram is provided as assistance to generators in understanding the waste transfer process. It should be noted that the criteria for the Waste Management Plan (WMP) are covered in the subcontract documents as part of the Technical Specification for Waste Management.

3.1 Waste Generation Plan

Each generator must complete a Waste Generation Plan (WGP) and submit it to the BJC Waste Operation Subcontractor (WOS) Subcontract Technical Representative (STR) and WESKEM for approval prior to initiating waste-generating activities (format and instructions for the WGP are in Appendix A). The purpose of the WGP is to provide the BJC Waste Disposition Project and WESKEM sufficient information to assess the likelihood that waste identified as needing treatment, storage, and/or disposal at a PGDP TSD units meets the Waste Acceptance Criteria (WAC) for, and that capacity is available at, the particular TSD unit. The majority of the information necessary to complete the WGP can be gleaned from the generator's WMP. The requirement of submitting a WGP separate from the WMP is to condense the necessary information into as brief a format as possible. For this reason, a WGP must reference an approved WMP. If necessary, generators may contact BJC WOS STR and/or WESKEM for assistance in completing the WGP.

The WGP requires the generator to identify intended treatment and/or disposal options for all wastes being transferred to a PGDP TSD units (all of which is contained in the generator's WMP). If wastes being transferred to a PGDP TSD units does not meet one of the acceptance criteria established in this document, the generator may request a variance by submitting form UCN-20702, Waste Variance Request (Appendix K), with the WGP. The variance may be granted if it is determined that conditions exist which make it exceedingly difficult or impossible to meet a requirement, or if it is determined that the compliance status of either the generator's or TSD unit's site operations is not compromised by the variance. Variances will not be granted due to conveniences. The generator must thoroughly document all requests and the BJC Waste Disposition Project Manager must approve them.

If project or waste generation processes change, the generator must immediately notify the BJC WOS STR and WESKEM, in writing that the change occurred. The WGP must be reviewed and revised as necessary for each affected waste stream. Depending on the significance of the change, the transfer of waste under the affected WGP may be halted until a revised WGP is approved.

3.2 Request for Disposal

Once waste is generated, containerized, fully characterized, and appropriately labeled and marked, the generator will submit a Request for Disposal (RFD) and associated documentation to WESKEM for approval. The RFD must reference an approved WGP and be submitted no later than three business days prior to the desired transfer date. WESKEM shall verify that the RFD agrees with the approved WGP and all necessary documents are present. Once verified, approval for transfer will be given to the generator. The format and instructions for the RFD are in Appendix I.

If the need for a variance is identified after approval of the WGP, form UCN-20702, Waste Variance Request should be submitted with the RFD. Additional time may be needed to evaluate the variance request, which may cause a delay in the approval for the RFD. Generators should plan accordingly.

Generators will be responsible for providing charge codes and necessary information to the BJC WOS STR to develop a work release to WESKEM for the transfer of their waste to a PGDP TSD unit. WESKEM will not work any generator RFD without an approved work release. Generators should contact the BJC WOS STR at least five work days prior to submitting the RFD.

3.3 Time of Transfer

After the RFD is approved, generators will coordinate the delivery of wastes with WESKEM. On the day of delivery WESKEM will verify the appropriate shipping documentation is present, waste containers are properly marked and labeled, and radiological surveys have been performed by Health Physics.

WESKEM may open waste packages to conduct visual verification of waste type and form. If conducted, it will be the generator's responsibility to provide the necessary replacement tamper indicating devices (TIDs).

Generators must correct deficiencies found during receipt inspection of the waste before waste will be accepted. If generators are unable to correct the deficiencies, WESKEM will not accept the waste.

Off-site generators (waste generated outside of the PGDP security fence) must provide to WESKEM, at least three days in advance, written notification of planned shipments of waste to PGDP TSD units. The notification may be transmitted with the RFD. Intent to ship may be communicated to WESKEM via telephone in emergencies.

On-site generators requesting delivery of waste to PGDP TSD units after 2:00 p.m. must obtain approval from WESKEM at least 24 hours in advance.

Figure 1. Waste Generation Process Flowchart

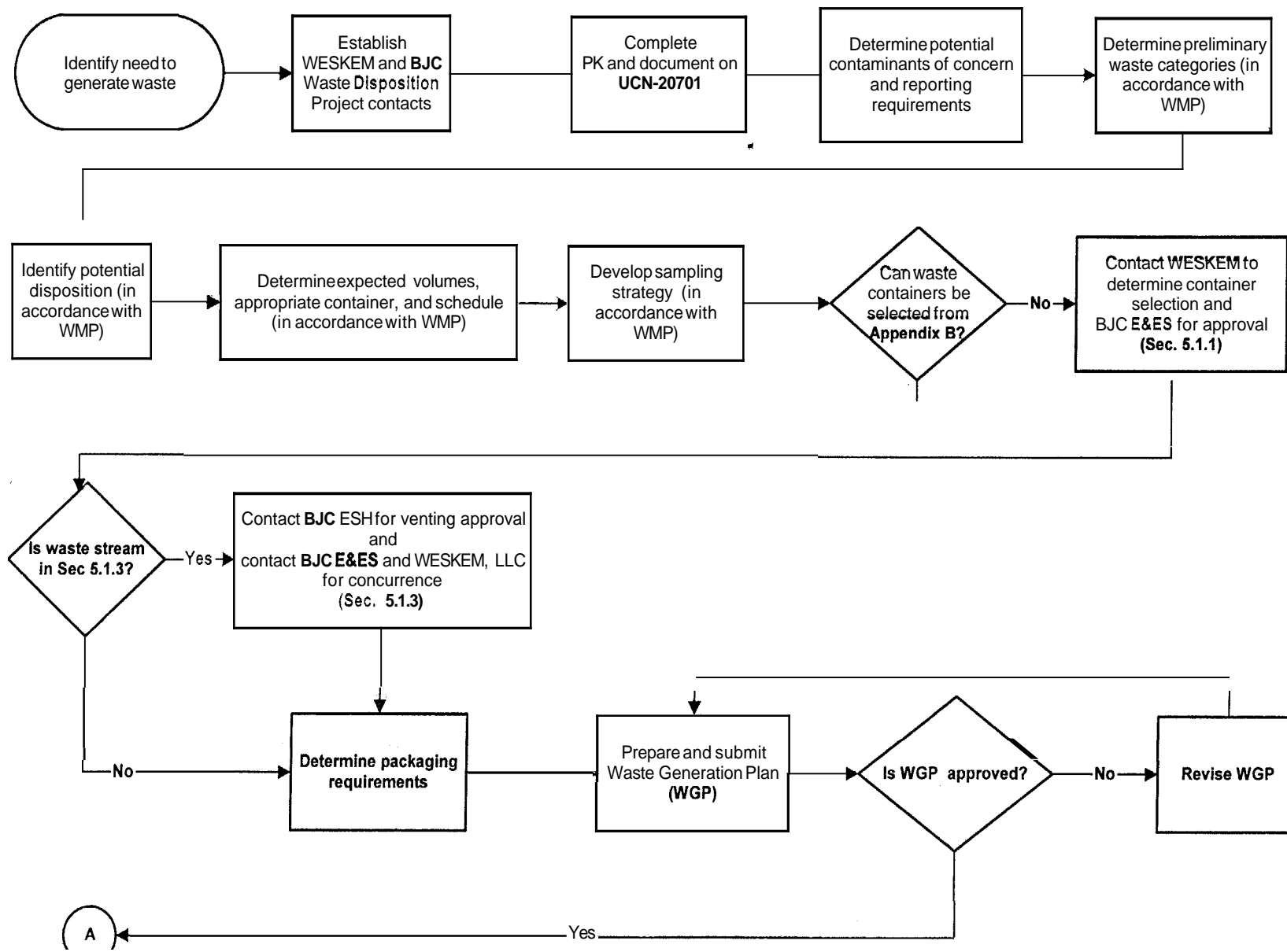
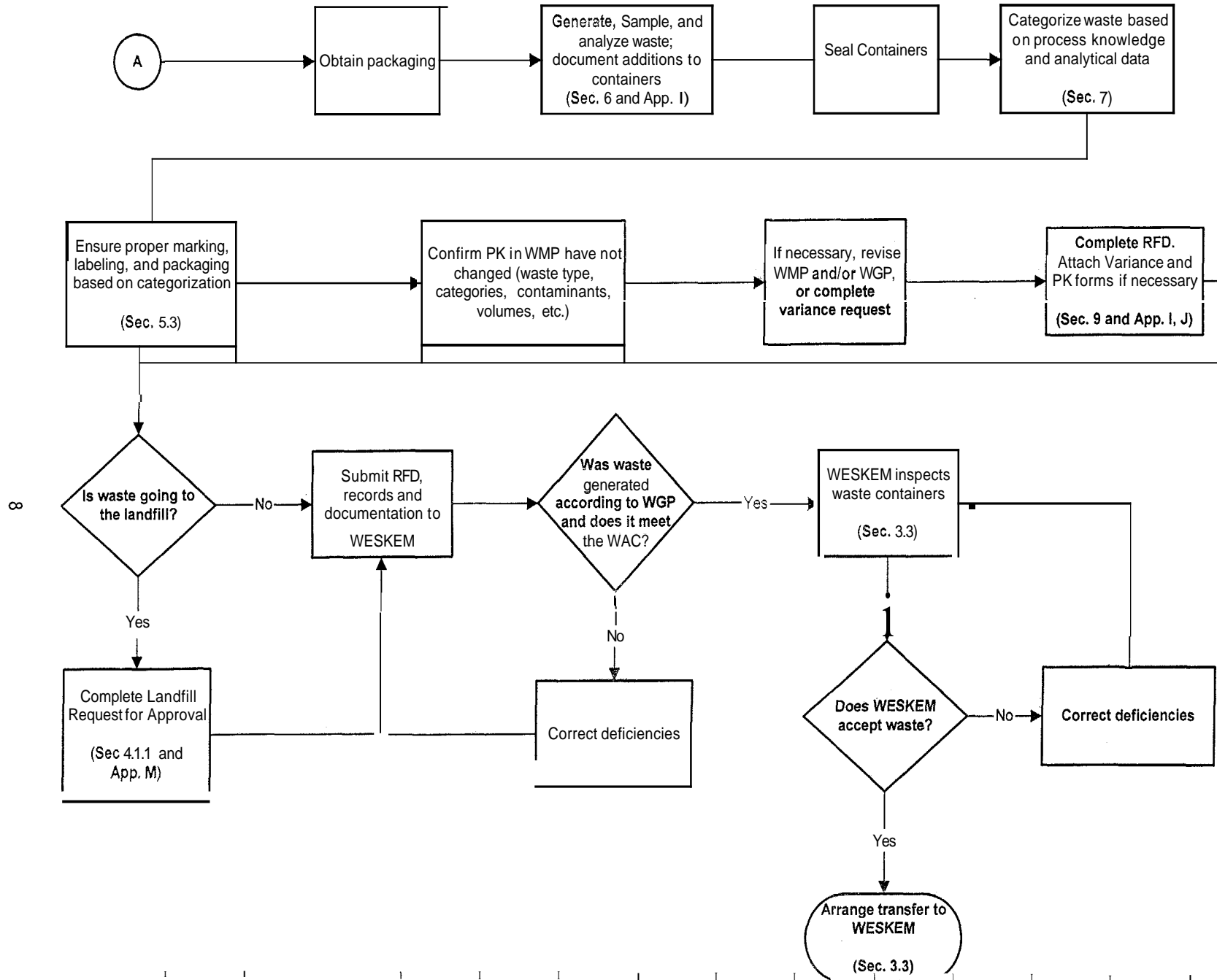


Figure 1. Waste Generation Process Flowchart (cont'd.)



4. WASTE CRITERIA

The criteria established in this document are for wastes being (1) disposed of in the C-746-U Contained Solid Waste Landfill, (2) treated at one of the on-site wastewater treatment units, and/or (3) stored in on-site waste storage units until shipment to an off-site TSD facility. Although some requirements established in this document apply to waste generation and storage while in the possession of the generator, most requirements for the management of the waste while in the possession of the generator are outside the scope of this document. The generator is responsible for managing waste during all phases of its life cycle, from generation to disposal.

Generators should be aware that any waste transferred must meet the requirements of each facility in which the waste will reside. As an example, waste to be treated in one of the wastewater treatment units requiring storage before treatment would need to meet the criteria of both Sections 4.3 and 4.4.

In addition to the criteria established in this section, all waste must meet the characterization requirements in Section 6 and containerization requirements in Section 5, unless otherwise exempted.

4.1 C-746-U SOLID WASTE LANDFILL CRITERIA

4.1.1 General Requirements

The C-746-U Landfill is a landfill permitted to dispose of only non-hazardous solid waste. It is not permitted to accept RCRA hazardous waste, TSCA -regulated waste and low level waste. The waste must be solid with no free liquids (as determined by the paint filter test) or environmental media that contained a listed waste must have an appropriate "contained in" determination to be classified as non-hazardous and it must meet any applicable Land Disposal Restriction (LDR) treatment standards. Acceptable waste cannot be commingled with classified items. The specific waste acceptance criteria are defined below.

As part of the RFD, generators shall complete the Landfill Waste Approval Request (Appendix M) and submit it as an attachment. "Nondumpster" sanitary waste, when coordinated with the Landfill Manager/Operator through the processing of a RFD, is acceptable, and does not require the submission of the Landfill Waste Approval Request.

4.1.2 Radiological Requirements

Waste for disposal in the C-746-U Landfill must meet one of the following requirements:

- Surface contamination levels must not exceed limits established in Attachment A of BJC procedure EH-4516, *Radioactive Contamination Control and Monitoring*
- Surface contamination levels that exceed limits established in Attachment A of EH-4516 must have a DOE approved Authorized Limits Request for the surface contaminated waste stream.
- Volumetric waste streams shall not exceed the mass concentration in a DOE approved Authorized Limits Request.
- Waste generated in radiological controlled areas shall be released in accordance with the

requirements established in EH-4516, Section H, Release of Material and Equipment to Uncontrolled Areas.

4.1.3 Specific Waste Item Requirements

Asbestos containing wastes - An asbestos-containing material (ACM) is any material that contains more than one percent asbestos. ACM found at PGDP may include, but is not limited to, transite, floor tiles and mastic, ceiling tiles, roofing materials, gaskets, thermal system insulation, etc. All asbestos containing wastes transported to the landfill must comply with the Department of Transportation (DOT) regulations. An estimate of the total volume of asbestos containing wastes, in cubic yards, must be annotated in Block W32 of the RFD.

Cardboard and paper - bagged or baled.

Animal carcasses - must be placed in double plastic bags with the ends sealed with tape or plastic wire ties.

Empty aerosol cans – must be punctured and not pressurized

Empty glass bottles - in heavy-duty plastic bags with lids or caps removed (if possible, crush bottles to reduce waste volume).

Fly ash - treated to minimize dust emissions and combustion concerns.

Gas cylinders (empty, disposable) - stems must be removed.

Medical wastes - treated by autoclaving before disposal or other methods of disposal as approved by the Landfill Manager.

Non-aerosol paint cans - bagged or baled. Contents must be completely dry and lids removed.

Radiological Tags and Flagging, etc. - cut and baled. Characterization must confirm no radiological contamination.

Personal protective clothing - (Tyvek suits, shoes, gloves, etc.) with HP survey documentation.

Small, loose items - if bagged or baled.

Tires - must first be processed by either cutting into quarters or shredding.

Used clothing, uniforms, and rags (non-hazardous, solvent laden, oily and clean) - characterization must confirm no radiological contamination and not TSCA or RCRA regulated.

Wood pallets, chocks and debris – remove visible oily stain areas.

4.1.4 Container Exemptions and Exclusions

Unless required in section 4.1.3 of this document, wastes disposed of in the C-746-U Landfill are not required to meet the containerization requirements in Chapter 5 of this document.

4.1.5 Prohibited Items

Any RCRA hazardous, TSCA regulated or radioactive waste are prohibited from being disposed of in the C-746-U Landfill. Examples include:

- Batteries (mercury, lithium, silver, nickel-cadmium, lead-acid)
- Circuit boards
- Classified waste
- Light bulbs (all types except non-hazardous "green-end" fluorescent)
- Light Ballasts

4.2 WASTEWATER TREATMENT AND STORAGE

Wastewater is acceptable for storage if it is categorized as RCRA hazardous, PCB, radioactive waste or if it exceeds Kentucky Pollutant Discharge Elimination System (KPDES) permit limits. Some wastewater may be treated in either the Activated Carbon Absorption Unit or the Photocatalytic Unit to reduce the level of contamination and/or render the wastewater dischargeable under the KPDES permit.

Wastewater will not be accepted for treatment at either the Activated Carbon Absorption Unit or the Photocatalytic Unit if it exhibits any of the following:

- Uranium enrichment ≥ 1 weight % ^{235}U
- Liquid waste containing less than 50% water
- Visible oils and grease
- A flash point of less than 140°F
- Total suspended solids greater than 10%, by weight
- PCB wastewater may not be accepted for treatment in Photocatalytic unit without a TSCA disposal permit

Groundwater contaminated with TCE and/or Tc-99 can be treated at the C-612 Northwest Plume Pump and Treat Facility. BJC manages this facility and CDM Federal Programs Corporation, the C-612 subcontractor operates the facility. Groundwater will not be accepted for treatment if it exhibits any of the following:

- Groundwater containing sediments
- Groundwater contaminated with other radionuclides and organics
- Wastewater not associated with the contaminated groundwater plumes

4.3 WASTE SUBMITTED FOR STORAGE

The PGDP waste storage units safely store RCRA-hazardous wastes, TSCA-regulated wastes, low-level radioactive wastes (LLW), transuranic wastes (TRU), and sanitary solid wastes. The PGDP waste storage units are designed to provide safe storage until the generator can facilitate the proper treatment and/or disposal for the

waste. It is stressed that while waste is being stored at a PGDP TSD that the generator remains responsible for the waste, and that accepting waste for storage does not imply the waste meets the acceptance criteria for off-site treatment and/or disposal. The following criteria must be met to ensure that waste can be safely handled and stored at any of the PGDP TSD units.

4.3.1 General Requirements

All waste being submitted for storage must meet the specific WAC established in this section, in addition to being characterized in accordance with Section 6 and containerized in accordance with Section 5.

4.3.2 Hazardous Wastes

Hazardous wastes must be characterized and categorized in accordance with 40 CFR Part 261-268 and 401 KAR Chapters 31 through 37. All hazardous waste must have the proper waste code assigned, to include Underlying Hazard Constituents (UHC), and be identified on the WGP and RFD as such.

4.3.2.1 Specific Hazardous Waste Requirements

The generator must report and certify the following information in the WGP and/or on the RFD for RCRA hazardous or potentially RCRA hazardous waste as a condition of waste acceptance.

pH (applies to aqueous liquids only) - The pH of the liquid must be reported.

NOTE: For non-aqueous liquids which are suspected of being corrosive, the material should be tested to determine if it corrodes steel at a rate greater than 0.25 inches (6.35 mm) per year.

Flash point - The flash point of the waste must be reported by using process knowledge or testing. The actual flash point of the waste must be reported if above 90°F and below 210°F. (i.e., between these limits, the discrete value must be reported, not ~~<or>~~ a value.)

NOTE: If the flash point is < 73° F, a second boiling point result and the boiling point must also be reported.

EPA Characteristics and Listed Waste Codes - Any EPA listed waste codes must be reported if the waste is generated by specific source, non-specific source, acute toxic chemical, or toxic chemical that is listed in 401 KAR 31:040. This includes any environmental media that contains a listed waste and that does not have an appropriate "contained-in" determination. The waste must carry the applicable EPA code as specified.

4.3.3 PCBs

PCB wastes submitted for disposal must meet all the applicable requirements in federal regulations and the Commonwealth of Kentucky regulations. The generator should consult DOE/EH-4 13-9914, *Storage and Disposal of PCB Waste* when making classification, storage, treatment, and disposal decisions.

4.3.3.1 PCB Detectable

Solid waste and soil, is "PCB Detectable" if it has measurable PCBs above one ppm, but less than the regulatory threshold of 50 ppm, and is not from a source that meets or exceeds that threshold.

Waste oil is "PCB Detectable" if it has measurable PCB above two ppm but less than the regulatory threshold of 50 ppm, and is not from a source that meets or exceeds that threshold.

PCB Detectable waste must be identified on the WGP, RFD, and containers marked with detectable PCB label.

4.3.3.2 Specific PCB Waste Requirements

The generator must report and certify the following information in the WGP and/or on the RFD for PCB or detectable PCB waste:

TSCA-Regulated Constituents and Concentrations - The presence of TSCA-regulated PCBs in the waste must be identified. The PCB concentration in milligrams per kilogram and the source of the PCBs must be reported.

PCB- and Detectable-PCB Articles - Items such as capacitors and transformers that contain regulated or detectable levels of PCBs, have the following special reporting requirements:

- date-to-storage (the date removed from service)
- the type of equipment
- the manufacturer's name
- an identification or serial number
- Kilo Var rating, volume of liquid (electrical equipment only)
- quantity of PCB dielectric (regulated or detectable),
- a notation of whether the item is leaking or non-leaking.

Containerized and Bulk PCB Waste - the source, volume (or quantity), and date for each addition or removal from the container must be identified. The disposition of any material removed from the container must also be noted on the Waste Item Container Log (WICL).

4.3.4 Radioactive Waste

Radioactive waste is defined as solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible economic value considering costs of recovery. PGDP has produced only LLW and potentially TRU wastes. LLW waste consists of three categories: LLW, PGDP Fissionable Wastes, and Nuclear Criticality Safety (NCS) Spacing Exempt Waste. LLW is discussed in Section 4.3.4.2, PGDP Fissionable Wastes, and NCS Spacing Exempt Waste are discussed in Section 4.3.4.3 under the heading of Fissionable Assay Waste. TRU is discussed in Section 4.4.4.4. Radioactive wastes must be identified as LLW, PGDP Fissionable Wastes, NCS Spacing Exempt Waste, or TRU on the WGP and RFD.

4.3.4.1 General Radioactive Waste Requirements

Percent Enrichment - For waste containing uranium, the percent enrichment of the uranium in ^{235}U , in weight percent must be reported on the WGP and RFD (See Appendix F for guidance).

Absorbent Materials - The type and quantity of absorbent materials in grams and must be reported on the WGF and RFD.

Naturally Occurring or Accelerator-Produced Radioactive Material (NARM) - For waste containing NARM, the NARM radionuclides present and their associated quantities (as total activity per waste package in curies) must be reported. DOE Order 435.1 defines NARM as any radioactive material that can be considered naturally occurring, and is not source, special nuclear, or byproduct material (as defined in the Atomic Energy Act), or that is produced in a charged particle accelerator. NARM radioisotopes must be identified and reported to the regulating authorities separately from other radioisotopes that are regulated under the Atomic Energy Act (source, special nuclear, or byproduct material).

Ion Exchange Resins - The presence of ion exchange resins must be identified.

Chelating Agents - Report active chelating agents greater than or equal to 1% of the weight of the waste. Report spent chelating agents in any quantity.

Sealed Source Radioactive Waste - The following reporting requirements apply:

- leak test results

NOTE: Any leak test that shows 0.005 μCi or more of removable contamination will be considered evidence that the sealed source is leaking its radioactive contents. If a leak test cannot be performed because of handling or measurement limitations, the source will be assumed to be leaking.

- a declaration, with descriptive justification, that the sealed source is no longer appropriate to the function for which it was produced or procured
- documentation that the sealed source is not suitable for recycle, reuse, or return to the manufacturer

4.3.4.2 Low-level Radioactive Waste

LLW is defined as radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, by-product material (as defined in section 11e(2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material.

Waste must be categorized as LLW if it exceeds the surface contamination limits established in Attachment A of BJC EH-45 16, *Radioactive Contamination Control and Monitoring*. Potential volumetric contaminated waste must also be categorized as LLW until verified as not radioactive by BJC.

LLW meeting the criteria of greater than Class C (GTCC) (10 CFR Part 61.55) must be identified on the WGP as such.

4.3.4.3 Fissionable-Assay Waste

LLW containing uranium with a ^{235}U enrichment greater than or equal to 1 weight %, is categorized as fissionable-assay waste. Fissionable-assay wastes being transferred to one of the PGDP TSD units must be managed in accordance with an approved NCS evaluation. All fissionable-assay wastes must be identified on the WGP and RFD as either "NCS Spacing Exempt Waste" or "Fissionable Material" and have the appropriate label applied to the waste package.

For acceptance of HAUP waste refer to NCSE-PG-0001 and applicable WESKEM procedures.

Waste containing fissionable radionuclides other than ^{235}U , will be assessed on a case-by-case basis. Fissionable nuclides are listed in DOE Order 420.1 "Facility Safety."

Waste containing the following cannot be accepted:

1. Significant quantities of beryllium and/or D_2O (ie. 0.1% of ^{235}U mass per container)
2. Significant quantities of bulk carbon (graphite) (ie. 20 times ^{235}U mass/container)

4.3.4.4 TRU Waste

TRU is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) High-level radioactive waste; (2) Waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) Waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. All transuranic assay waste must be identified on the WGP and RFD.

TRU Waste Reporting Requirements - In addition to all requirements above, the following must be reported for TRU waste:

- Combustible Materials present - an estimate of percent of combustible materials by weight (e.g.; 0%, 25%, 50%, 75%, 100%)
- Thermal Power - reports the thermal power in watts for waste generating $> 0.1 \text{ watts/ft}^3$
- Rad Handling Type - identify handling requirements (contact handle or remote handle)
- Heat-sealed Bags - identify the presence of heat-sealed bags
- Sealed Layers of Packaging - identify number and type, starting with the innermost layer and working outward

4.3.5 Mixed Waste

Mixed Waste is radioactive waste that contains a hazardous component, which is subject to the RCRA. Waste submitted for storage meeting this definition must satisfy the requirements for the storage of radioactive waste (Section 4.3.4) and the applicable hazardous component (4.3.2).

4.3.6 PCB/Radioactive Waste

PCB/Radioactive waste is defined as any waste that is regulated by TSCA as a PCB waste (Section 4.3.3) and contains radiological constituents that require treating the waste as a radioactive waste. PCB Radioactive waste must meet the requirements for both radioactive waste (Section 4.3.4) and PCB waste (Section 4.3.3).

4.3.7 ACM

An ACM is any material that contains more than one percent asbestos. ACM found at PGDP may include, but is not limited to, transite, floor tiles and mastic, ceiling tiles, roofing materials, gaskets, thermal system insulation, etc. All asbestos-containing wastes placed in temporary storage must comply with the DOT regulations. An estimate of the total volume of asbestos containing wastes, in cubic yards, must be annotated in Block W32 of the RFD.

4.3.8 Waste Not Fully Characterized

In some cases, the need may exist for waste to be transferred to a PGDP TSD unit before all applicable requirements in this document are fulfilled (i.e., waste may need to be removed from a full Satellite Accumulation Area before characterization is complete), and therefore all documentation may not be complete, WESKEM must be contacted for concurrence, and plans to complete all requirements must be made.

Certain minimum requirements must be met before waste is accepted. These minimum requirements are identified in the following discussion of each type of documentation.

Assay Determination - Required before waste will be accepted if waste has the potential to be radioactive. See DQO tables found in Appendix F for assay determination guidelines.

Certification Package (Landfill Waste Candidate) - Required for evaluation of waste for solid waste landfill disposal. The package must contain the RFD and Attachment C, the Landfill Waste Approval Request, the Process Knowledge form, Master Landfill Disposal Log Sheet, and supporting documentation, including characterization analytical data (see Appendices I, J, and M).

Characterization Data (Analytical Data) - Data and associated documents which are used to characterize the waste stream. This may include laboratory analytical data, the sampling and analysis plan, process operating procedures and any other documentation that allows the data to be related to the waste stream. Any waste that will be shipped offsite for treatment and/or disposal or on-site disposal must have their analytical data loaded into the Paducah Oak Ridge Operations Office Environmental Information System (OREIS) database or have an approved Waste Variance Request form. Waste may be transferred to a TSD unit before all analytical data has been received. Certain data, however, are required before waste can be accepted. These include the following:

- pH, if the waste is liquid and has the potential to be RCRA corrosive
- flash point, if the waste has the potential to be RCRA ignitable
- assay in duplicate, if the waste has the potential to be radioactive

Process Knowledge Documentation (Appendix J) – If used, Process Knowledge Form, UCN-20701, (Appendix J) must be completed and submitted with the RFD.

RFD - Required before waste will be accepted.

Waste Item Container Log (Appendix I) - For all containerized waste. Accompanies the RFD and is required before waste will be accepted.

Waste Variance Form (Appendix K) - The variance request will document the reason the waste needs to be transferred before all requirements can be met. In addition, the variance request will describe actions being taken to satisfy the waste acceptance criteria and the associated time lines.

Generators are reminded that if they fail to provide documentation as specified in the variance request, waste will not be accepted.

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5. CONTAINERIZATION

The generator is responsible for containerizing the waste, which includes selecting and procuring appropriate containers, packaging the wastes, marking and labeling waste packages, and storing waste packages before transfer. All containers and waste packaging activities must comply with the applicable requirements of:

- DOT regulations 49 CFR or approved alternatives
- DOE Order 435.1, "Radioactive Waste Management"
- 40 CFR 761.65 or allowances under TSCA Federal Facilities Compliance Agreement
- PGDP *Hazardous Waste Management* Permit
- 401 KAR 32, 34, 35
- 10 CFR 835, "Occupational Radiation Protection"
- 10 CFR 830.120, "Quality Assurance"
- CERCLA
- NTS Waste Acceptance Criteria DOE/NV-325 latest revision

5.1 Container Selection

Containers are selected based on the waste matrix, the compatibility of the waste material with the container, venting requirements and the expected disposal option for the waste.

5.1.1 Compatibility with Waste

The generator must place waste in containers that are compatible with the waste, as determined by testing, literature, or past operating experience and DOT requirements, and as documented in an approved WGP. Incompatible wastes shall not be placed in a container. Appendix B identifies containers for several typical PGDP waste stream categories. The generator **may** contact WESKEM for assistance in choosing suitable containers. Appendix B lists approved containers for various waste types. If waste is hazardous and not listed in Appendix B, the BJC Engineering and Construction Services Organization must approve the container selection.

5.1.2 Container Condition

Containers must be in good condition with no visible cracks, holes, bulges, dents, significant corrosion, missing rings or bolts, or other damage that could compromise current or future container integrity. Bungs must be tight and have gaskets in place. Rings and bolts must be applied properly. Bolts must be properly tightened to specific foot pounds as **recommended** in container specific closure instructions.

NOTE: Vendor drums are not acceptable for reuse to store waste, unless specifically approved by WESKEM.

NOTE: Interchanging container parts may void DOT packaging compliance.

5.1.3 Venting Pressure Relief Devices

All drums must have bungs. In addition, the generator must ensure that containers of non-hazardous waste that have the potential to generate gas pressure due to decay, elevated temperature, volatility, or chemical reaction are stored in approved containers equipped with approved pressure relief devices (vents). Wastes that typically produce gas pressure build-up, and must be evaluated to determine if venting devices are required, are:

- Material containing waste oil
- Waste from painting operations
- Solutions from laboratory operations
- UF₄ sludge/rust
- Uranium metal turnings
- Sludges
- Waste containing vegetation or other organic matter (e.g., grass, wood, wet cardboard/paper etc.)
- Aerosol cans
- Volatile organics
- Aqueous/organic mixtures
- Low pH solutions
- Biological wastes
- RCRA ignitable waste (flash point <140°F)

For all hazardous wastes, BJC Environmental, Safety and Health Organization (ESH) and BJC WOS STR must approve the use and type of venting devices prior to use. For ignitable wastes, drum vents must be Factory Mutual Insurance Company (FM) or Underwriter's Laboratories (UL) listed. For corrosive waste, drum vents must be compatible with the waste material.

5.2 Packaging

5.2.1 Void Space

All containers containing solids should be filled to the maximum extent possible. All drums containing liquids must have the following head space: 5-gallon, 1 inch nominal; 30-gallon, 2 inches nominal; and 55-gallon, 4 inches nominal. Wastewater stored in tanks must allow for a void space equal to approximately 10% of the tank volume. Irregularly shaped solid wastes must be size reduced and arranged in the container in a manner to minimize void space to the extent practical.

5.2.2 Overpackaging and Repackaging

Waste packaging must be maintained so that the contents are suitably confined for the duration of the anticipated storage life. If the integrity of a container fails due to age, incompatibility with the waste, or other physical damage, the waste must be repackaged or overpacked as appropriate for that waste type. WESKEM must approve the decision to repack or overpack.

See Section 5.2.3 for overpacking of fissionable waste.

Nonfissionable Liquid waste cannot be overpacked. It must be transferred into another container. Fissionable liquid waste can be overpacked with an approved Waste Variance Request (see Appendix K).

Salvage drums (overpacks) may be used for solid waste only. If a solid waste container appears to have corroded due to a potential reaction with its contents, the waste must be transferred to another container.

5.23 Requirements by Waste Type/Matrix

The waste media or matrix affects the container selection. See Appendix B for designated containers of typical PGDP waste types.

Asbestos or Asbestos-Containing Waste - Asbestos-containing waste must be packaged into two 6-mil polyethylene bags with the tops twisted, goose necked, and taped separately. The bags may be placed in metal or fiberboard containers for landfill disposal. If the waste is radioactive, the bags must be placed in metal containers (see Radioactive Waste).

Beryllium Containing Waste - Beryllium containing waste and beryllium containing equipment must be packaged in sealed, impermeable bags (minimum 6 mil), containers, or enclosures to prevent release of beryllium dust during handling and transportation.

Laboratory Packs - WESKEM must approve laboratory packs of small containers, absorbent material, and packaging. Lab packs must be packaged in container; with enough approved absorbent to absorb 100% of the laboratory packs' contents. Incompatible materials cannot be packed together.

Liquid or Free Liquid Over Solid Waste - Free or drainable liquids (identified by a paint filter test, EPA SW-846 Method 9095) must be placed in containers that are approved for liquids. Small amounts of free liquids, which cannot be drained, may be absorbed using an approved sorbent. (NOTE: If waste is RCRA regulated, absorbents can only be added to the waste container at the time of generation.)

Mercury and Articles Containing Mercury - Mercury must be drained from all glass mercury manometers, the tubing segments of which must not exceed 2.5 ft in length. Free liquid mercury must be placed in DOT approved containers, the volume of which must not exceed 1 liter. All mercury-containing thermometers must be double-packaged and properly labeled.

Miscellaneous Equipment - WESKEM should be consulted for guidance for packaging miscellaneous equipment which contains light bulbs, fire extinguishers, lead acid and nickel-cadmium batteries, circuit boards, fuses, capacitors, and other related materials.

PCB and PCB Articles - Leaking PCB and Detectable-PCB equipment must be packaged with enough absorbent to absorb 100% of any remaining liquid. Non-leaking PCB and Detectable-PCB equipment that cannot be containerized must be drained of all free liquids whenever possible before being moved. If the equipment cannot be drained, all openings must be sealed to prevent the liquid from leaking during movement and storage.

Sealed Source Radioactive Waste - Sealed source wastes that are known to be leaking or that contain more than 5 Ci of radioisotopes with half-lives greater than 5 years must be packaged in containers that have been evaluated and approved by WESKEM, BJC WOS STR, BJC Engineering and Construction Services (E&CS) and BJC ESH.

Radioactive Waste - Packaging must meet DOE Order 435.1, "Radioactive Waste Management" and must meet DOT requirements if it contains greater than 70 Bq of total radioactivity per gram (gm) (1890 pCi/gm) radioactivity.

Radioactive waste requiring a “Fissionable Material Storage Container” label (Category 2 only) or “NCS Spacing Exempt” label (Category 1 only) (Section 5.3) must be packaged in accordance with requirements in the current NCS Evaluation. The contents of NCS Spacing Exempt containers may be repackaged or overpacked, but never consolidated without NCS approval. Containers smaller than **30** gallons that do not meet the 15 gram exemption must be overpacked into a 30-gallon or larger container.

Refrigerants and Liquids Contained in Articles - All liquids and any refrigerants must be drained from equipment and reservoirs plugged. Any oil-bearing equipment must have the oil characterized for PCBs and analytical results attached to the RFD. All drained reservoirs must have absorbents added to absorb any residue that may accumulate during storage. Addition of absorbents or the inability to drain a reservoir must be noted on the appropriate RFD or container logsheet.

Sludge - Sludge must be decanted or dewatered so that the container contents will pass the paint filter test. Small **amounts** of **free** liquids that cannot be drained may be absorbed using an approved absorbent. (NOTE: If waste is RCRA regulated, absorbents can only be added at the time of generation.)

Solid Wastes – All solid waste packages required the following plastic liners

- Drums require a minimum 10 mil polyethylene plastic liner
- Boxes require a minimum 15 mil polyethylene plastic liner
- Roll-off Bins require a minimum 6 mil polyethylene liner

5.2.4 Landfill Waste Packaging

If drums of waste are delivered to the landfill in larger containers, e. g., roll-off bins, then the drum identification number must be written on the top of each drum in approximately three-inch letters. Other packaging requirements for waste to be disposed in the C-746-U Landfill vary depending on the waste item itself. Waste packaged in boxes, e.g. B-12, B-25, ST-90, 7A Type A, may be accepted for landfill disposal on a case by case basis by the use of an approved Waste Variance Form (UNC-20702).

5.2.5 Documentation of Waste Package Contents

For all waste packages, a detailed record must be kept of the contents, volume, and weight, as well as any added void fillers, sorbents, stabilization agents, or solidification agents. This information is to be documented on UCN-20700, Waste Item Container Log (or similar form) and completed before waste is placed into the waste packaging.

5.2.6 Liquid and Liquid Containing Waste

For waste being stored as other than liquid waste, all free liquids must be sorbed in accordance with Appendix E, or otherwise removed from the waste.

- For liquid-containing waste where condensate could form in the inner plastic packaging (e.g. bags) subsequent to containerization, the condensate shall be eliminated to the maximum extent practical by placing sorbents within the inner plastic packaging. The type and amount of sorbent required shall be in accordance with Appendix E. In any case, the amount of liquid cannot exceed 1% of the volume of the waste or 0.5% of waste processed to a stable form.

- Residual liquids in large debris items shall be sorbed or removed. In cases where it is not practical to remove suspected liquids and it is impossible to sample to determine if liquids are present, the liquids shall be removed to the maximum extent possible by draining suspected liquids at low points and placing an adequate amount of sorbent around each item. In any case, the amount of liquid cannot exceed 1% of the volume of the waste.
- For liquid containing waste items that are sealed, quantity of liquid shall be noted on RFD.

5.2.7 Chain-of-Custody Seals

The generator must seal containers immediately after they are sampled. A chain-of-custody seal that displays an identification number must be placed on each container in such a position that the container cannot be opened without breaking the seal. The identification number from the chain-of-custody seal must be recorded on the waste analysis form and the RFD form or attachment.

5.3 Marking and Labeling

The generator must label and mark all containers consistent with information in the approved WGP and as shown in Appendix D. All labels and markings must be legible and properly positioned on the container. All waste containers must have the labels and marking shown below:

- Waste Container Label (See Appendix D)
- United States Enrichment Corporation or DOE waste label (Appendix D)
- Appropriate waste category or identification labels (see Sections 5.3.2 through 5.3.7 and Appendix D)
- NOTE: Generators must label containers **with** the expected category if characterization has not been completed. If characterization confirms that waste is not categorized as labeled, then inappropriate labels must be removed and the correct ones affixed.
- RFD container number, the appropriate date (generation date, date to storage or the accumulation start date) and contents written on the container in permanent marker
- Classified Material Label, if applicable (see Appendix D)
- HP Survey tag, if container's contamination cannot be removed

Additional information by waste category is shown in Sections 5.3.3 through 5.3.8. For waste that exhibits more than one category, marking and labeling requirements for all pertinent categories apply.

5.3.1 Label/Marking Placement

Labels should be placed to the left of the drum seam. Written markings should be placed to the right of the drum seam. All labels and markings must be placed on the upper one-third of the container. One set of labels/markings on the side of a drum is acceptable (see Appendix D). Bulk containers (such as ST-90 and B-25 boxes) require additional labeling on opposite sides of the container (Appendix D).

Markings must be legibly written in a color that contrasts with the container color.

5.3.2 Durability

Labels and markings must be durable, fade-resistant, water-resistant paints, vinyl stickers, or must be sufficiently durable to remain intact and legible during management of the waste before disposal.

5.3.3 Hazardous Wastes

The Hazardous Waste Label must be applied to waste packages of suspect or confirmed hazardous waste (see Appendix D).

The accumulation start date (AD) must be marked on all hazardous and mixed waste containers. The date accumulation begins is the date that the first drop of waste is generated and placed into a container. It is not the date when the generator receives the waste analysis results. In order to avoid confusion regarding the regulatory status of unknown (suspect hazardous) wastes, labeling that says "Hazardous Waste Pending Analysis" is recommended. For waste originating from a satellite accumulation area, the accumulation date is the date an excess accumulation begins (i.e., greater than 55-gal hazardous waste or 1 quart of acutely hazardous waste), or it is the date the waste goes into a 90-day area. The accumulation date may be written as AD, followed by the date (See Figure 2 for Hazardous Waste Accumulation Date Flowchart).

5.3.4 PCB

The PCB M_L label must be applied to containers of TSCA-regulated PCB waste (waste containing or coming from a source containing ≥ 50 ppm PCBs). (Appendix D)

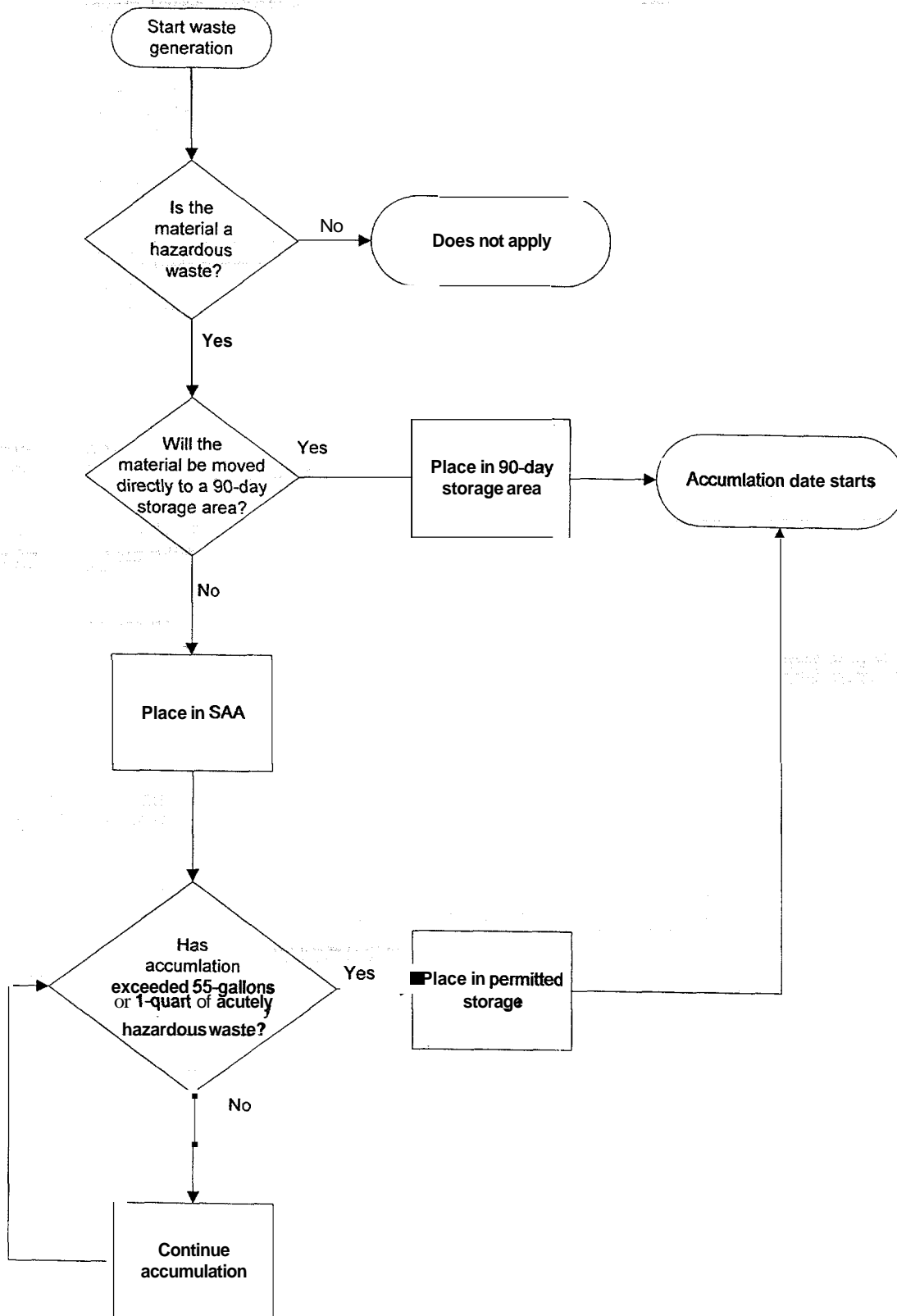
The Date-to-Storage must be marked on the container. This is the date that the first PCB article or item is placed in a container or the PCB item is removed from service (whichever is first). It may be written as "Date to Storage" or "DTS", followed by the date. For PCB equipment or articles, the DTS is the date the item was removed from service for disposal.

The Detectable PCB label (see Appendix D) must be applied to containers of waste with the concentration of PCBs above the detection limit for the waste matrix, but less than 50 ppm PCBs and not from any PCB source of 50 ppm or greater in concentration.

5.3.5 Radioactive Waste

The Radioactive Material label must be applied to containers of suspect or confirmed radioactive waste. (Appendix D)

Figure 2. Hazardous Waste Accumulation Data Flowchart



The Fill Date/Generation Date must be marked on all containers of radioactive waste. This is the date that the container is filled. It may be written as “Generation Date” or “GD” followed by the date.

Any waste container with radioactivity of > 0.3 and ≤ 3 Ci per cubic meter per volume of waste from ^{99}Tc must be marked as “Class C”. Any container which exceeds 3 Ci per cubic meter of radioactivity per volume of waste from ^{99}Tc must be marked as “> Class C.” (10 CFR 61.55).

5.3.5.1 Fissionable Assay Waste

In addition to the Radioactive Material label, packages containing waste meeting the definition of fissionable assay waste and contain greater than or equal to 15 grams of ^{235}U must be labeled with the “NCS Spacing Exempt” label or the “Fissionable Material Storage Container” label found in Appendix D.

For labeling of HAUP waste refer to NCSE-PG-0001 and applicable WESKEM procedures.

5.3.5.2 TRU Waste

In addition to the Radioactive Material label, waste packages containing TRU are to be labeled with the TRU Waste label (see Appendix D).

5.3.6 Asbestos

Containers of asbestos waste are to be labeled with the Asbestos label (see Appendix D).

5.3.7 Wastewater

Wastewater tanks are to be labeled using Wastewater Tank label (UCN-19088) as shown in Appendix D.

5.3.8 Beryllium

Containers of Beryllium waste are to be labeled with the Beryllium label (see Appendix D).

5.4 Miscellaneous

5.4.1 Lid Ring Placement

For removable head drums, the ring must be placed on the lid so that the bolt is situated over the seam.

5.4.2 Exterior Contamination

The outside of each container must be free of radioactive or chemical surface contamination, with no oily residue or debris on the outside, including the bottom and must be surveyed in accordance with EH-45 16.

5.4.3 Use of Pallets

Waste accepted for storage at PGDP TSD units must be delivered on appropriately sized, approved pallets constructed of *oak* wood, metal, or plastic, stackable, and having a minimum of a 2-way fork entry. Shipping pallets are not acceptable. The containers must be placed on the pallets so that the labels and markings face the aisles while in storage,

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6. CHARACTERIZATION

The generator must characterize all waste offered for treatment, storage and/or disposal to allow for proper segregation, container selection, packaging, handling, storage, and treatment/disposal of the waste. The WGP must include the proposed strategy of waste characterization.

Characterization involves the determination of regulated constituents present in the waste, and some additional analyses, which may be required for reporting purposes. It is recommended that generators consult the EPA/600/R-96/05, Guidance for the Data Quality Objective (DQO) Process, BJC/PAD-437 Waste Disposition's Characterization Plan for PGDP, BJC/PAD-482 "Methodology for the Application of Process Knowledge to NCS Characterization of Waste Streams" and Appendix F, Nuclear Criticality Safety DQOs. These documents will assist generators to: "clarify the objective of the characterization plan; define the most appropriate data to collect; determine the most appropriate conditions to collect the data; and specify tolerable limits on decision ~~errors~~ which will be used as the basis for establishing the quantity and quality of data needed to support the decision" (EPA, 1994).

6.1 General Requirements

The characterization methods and procedure shall ensure that the physical, chemical, and radiological characteristics of the waste are recorded and known during all stages of the waste management process.

Waste streams must be re-characterized if a process, operational change, or activity occurs that impacts chemical, physical or biological characteristics or the categorization of the waste. The generator is responsible for characterization repeated as necessary to ensure that it is accurate and up to date.

6.2 Process Knowledge

When the constituents of a waste stream are well known and properly documented, the generator may use process knowledge for characterization. Process knowledge, as it applies to waste certification, is documented knowledge of the processes and sources associated with generation of a waste or waste stream that allows a reliable estimation of the constituents and quantities for handling, storage, treatment, and disposal. Process knowledge is information, ultimately based on either analytical data or knowledge of the waste generating activity, that relates to the material to be characterized, but does not directly represent the material itself.

Some examples of process knowledge which may be used to characterize a waste stream, or to eliminate a contaminant of concern, are shown below:

- sampling and analysis results for the process
- procurement specifications
- vendor data (including hazardous materials analytical results)
- material balance and concentration calculations
- analytical results from similar processes
- results from laboratory or pilot studies (e.g., treatability studies)
- administrative/procedural controls

- Material Safety Data Sheets (MSDSs)

If the generator wishes to use process knowledge to characterize waste, the generator must first submit a Process Knowledge Form (UCN-20701, see Appendix J). WESKEM must review the WGP and the Process Knowledge Form to determine if process knowledge can adequately characterize the waste stream. When historical analytical data is used, the data limitations must be documented.

6.3 SAMPLING AND ANALYSIS

When used, sampling and analysis shall be performed to provide legally and scientifically defensible data that can be used to identify chemical, physical, and radiological properties of the waste. The sampling and analysis process to characterize waste streams shall be controlled and documented by the generator. Propagation of errors throughout the sampling and analysis process shall be considered and evaluated when ascertaining usability of data for characterization of waste. When wastes are containerized, controls shall be in place to track each sample number to a specific container/package number. Waste characterization should be considered as part of the DQO process.

Samples taken shall be representative of the waste and shall be collected in accordance with EPA-approved protocols, sampling protocols in the current collection of SW-846, Test Methods for Evaluating Solid Waste, industry-standard protocols, or equivalent.

6.3.1 Analytical Methods

The BJC Sample Management Organization must approve all analytical methods used to characterize waste. Instrument/method detection limits must be sufficiently low to ensure that measurements at or below the regulatory threshold for each constituent are possible.

6.3.2 Radionuclide Determination

The concentration of radionuclides in each waste container may be determined by direct measurement. The expected radionuclides and their associated emissions, the matrix of the waste, and any other factors that would affect the accuracy and sensitivity of the measurement must be taken into account before a direct measurement method is chosen. For example, it would be inappropriate to measure ^{99}Tc , which emits only beta particles, by performing gamma ray spectroscopy.

Indirect methods, such as scaling factors, material accountability, or documented process knowledge, must be validated by comparison to a direct measurement and documented. Scaling factors are often used when it can be shown that there is a correlation between a measurable property of the waste and the concentration of a specific radionuclide. Radionuclide distributions shall be initially determined and periodically verified through direct measurements or sampling and analysis. Development and use of scaling factors must consider the waste package and detector geometry's shielding and attenuation effects; and the energy spectra and decay schemes of the radionuclides in the waste. Other indirect methods, such as material accountability and process knowledge, may be acceptable ways of characterizing waste if they are validated initially and on a routine basis and properly documented.

For the purpose of determining uranium, assay less than 1% by weight ^{235}U any of the following are acceptable methods:

- Thermal Ionization Mass Spectrometry (TIMS)
- Non-Destructive Assay (NDA)
- Gamma Spectrometry (if less than 0.711% by weight ^{235}U)

- Inductively Coupled Plasma (ICP) Mass Spectrometry
- Process knowledge (e.g., uranium contaminated material from the C-3 15 facility is depleted)

For the purpose of determining uranium **assay** equal to or greater than 1% by weight ^{235}U the following are the only acceptable methods.

- Thermal Ionization Mass Spectrometry (TIMS)
- NDA
- ICP Mass Spectrometry
- Process knowledge (e.g., a maximum of **5.5 wt %** can be assumed for waste streams generated from PGDP process equipment)

Exemptions from the use of these methods must have an approved Waste Variance Request. If greater than or equal to 1% by weight ^{235}U , then independent duplicate TIMS or NDA or ICP mass spectrometry analyses are required.

6.3.3 Data Quality Objective (DQO) for Nuclear Criticality Safety and Analysis

A set of DQOs has been developed and shall be used in sampling and analytical methods that produce data used in making NCS decisions at the PGDP. For the following waste streams a set of DQOs are provided and must be used in Appendix F:

- A. Solid Trap Mix Materials
 - Sodium Fluoride Trap Mix
 - Magnesium Fluoride Trap Mix
 - Alumina Trap Mix
- B. General Liquid/Sludge Materials
 - Degreaser Solvents
 - Filtrate from C-400 Dissolver and C-409 Uranium Recovery
 - Solutions from C-400/C-409 Storage Tanks
 - Spray Booth Solutions
 - Laboratory Solutions
 - Cylinder Wash Sludge
 - Uranium Precipitate (C-400 Dissolver and C-409 Uranium Recovery)
- C. Potentially Fissile Oils
 - Seal exhaust solutions
 - Rinney Pumps
 - Normetex Pumps
 - Vacuum Pumps
- D. Other Solid Materials
 - Vacuum Dust
 - Slugged Oil
 - Lab Waste – unknown source
 - Lab Waste – known source
 - Filters (from negative air machines)

- Spill clean-up waste

For potentially fissile waste streams at PGDP that are not covered by the DQOs, or Methodology for the Application of Process Knowledge to NCS Characterization of Waste Streams BJC/PAD-482, NCS should be contacted for assistance at 441-5120.

6.4 Contaminants of Concern

The generator must consider all contaminants of concern (CoC) during the characterization of a waste stream. CoC are those regulated contaminants that have the potential to be present in a waste stream. Not all RCRA hazardous, TSCA, or radiological contaminants are found in waste generated at the PGDP.

The characterization plan must address each of the contaminants listed in Sections 6.4.1 through 6.4.3. A generator may use process knowledge to eliminate some potential contaminants of concern in a particular waste stream. Any CoC that cannot be eliminated must be addressed with analytical methods.

6.4.1 Hazardous Constituents

Waste must be adequately characterized to facilitate the proper identification of all constituents and characteristics identified in 40 CFR Part 261. As stated in Section 6.2, a generator may use process knowledge to identify or eliminate many of the constituents or characteristics. Each characteristic or constituent must be considered and either eliminated as a concern by process knowledge or measured.

6.4.1.1 RCRA Hazardous Material Spot Contamination on Personal Protective Equipment (PPE) and Plastic

All PPE and plastic shall be segregated based on visual inspection. Waste must be handled in the following manner:

- If no visible signs of chemical stain are seen, then the PPE may be categorized as non-hazardous.
- If visible stains are seen, the stained area may be cut away, if practical, and segregated from unstained. If the stained article was generated while handling listed RCRA waste, the article must be managed as listed RCRA waste.
- If the stained article was generated while handling characteristically hazardous RCRA waste, then the categorization must be based on the amount of contamination, or the article may be representatively sampled.

6.4.2 PCBs

PCBs which have the potential to exist in waste at PGDP include the following:

- Aroclor 1016
- Aroclor 1221
- Aroclor 1232
- **Aroclor** 1242
- Aroclor 1248

- Aroclor 1254
- Aroclor 1260
- Aroclor 1262
- Aroclor 1268

Waste must be adequately characterized to facilitate proper identification of PCB contamination as required by 40 CFR 761. Process knowledge can be used to identify or eliminate the presence of PCBs. Each constituent must be considered and either eliminated by process knowledge, or measured.

6.4.2.1 PCB Spot Contamination on PPE and Plastic

Discarded PPE articles, generated while managing PCB waste which is ≥ 50 ppm, shall be visually inspected for stains, and handled in one of the following ways:

- If no areas of stains are seen, then the PPE may be categorized as non-PCB waste.
- If visible stains are seen, the stained area may be cut away, if practical, and segregated as PCB waste.

If the PPE articles are generated while managing non-PCB waste, then the PPE articles must be categorized as non-PCB waste for disposal.

6.4.3 Radiological Constituents

The following radiological contaminants have the potential to exist in waste at PGDP. The waste should be evaluated for each one that cannot be eliminated by process knowledge,

Transuranics	- ^{237}Np , ^{238}Pu , $^{239/240}\text{Pu}$, ^{241}Am , ^{232}Th
Uranium & Thorium	- ^{234}U , ^{235}U , ^{238}U , ^{230}Th , ^{228}Th
Fission Products	- ^{99}Tc , $^{89/90}\text{Sr}$, ^{137}Cs , ^{60}Co

Isotopic distribution and corresponding activity concentrations shall be traceable to the package. Traceability to a parcel level shall be performed if characterization is being conducted at that level (e.g. individual sealed sources, bags or components characterized on an individual basis but packaged together).

In addition to determining the total uranium present in the waste, the percent weight enrichment of ^{235}U must be determined.

Waste activity concentrations shall be based on the weight of the final waste form (excluding the weight of the container and any shielding) intended for storage or disposal. For the criteria of reporting the progeny of parent radionuclides, generators shall use the criteria in 49 CFR.

For potentially fissile waste streams at PGDP that are not covered by the DQOs, NCS should be contacted for assistance at 441.5 120.

6.5 CHARACTERIZATION REPORT

A characterization report shall be submitted with the RFD to WESKEM. Information normally required in a waste characterization report can be found in Appendix C. The characterization report can contain as little

as a process knowledge form or up to all of the information in Appendix C. For information that has been addressed elsewhere, (such as SAP, QAP, DQOs, etc.) need only to be referenced in the characterization report.

7. CERTIFICATION

Generators must certify that they have complied with their WGP and that the information in their WGP, RFD, or manifest form is accurate and complete. A certification statement must be signed to accompany each RFD (see Appendix I form UCN-20700 **Box W34**). By signing the certification statement on the RFD form, the generator certifies that information included on the RFD form and its attachments are **true** and accurate. Deviations from the WGP or the requirements in this WAC should be documented on the Waste Variance Form (Appendix K), and must be approved by BJC Waste Project Manager and WESKEM. Generators are responsible financially for costs incurred as a result of nonconformance with the criteria established in this document.

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8. USEC AND LEGACY WASTE AGREEMENT EXCEPTIONS

Unless otherwise specified in a written agreement between the United States Enrichment Corporation (USEC) and DOE, waste generated by USEC will comply with this document with the following exceptions.

8.1 Exceptions provided for Temporary Storage of USEC Hazardous Waste/Mixed Wastes

8.1.1 Exception to Section 3.1

A WGP is not required.

8.1.2 Exception to Section 5.1

USEC shall package all newly generated waste in DOT-compliant packaging, but not necessarily in the packaging specified in Appendix B.

8.1.3 Exception to Section 5.2.1

Void spaces will be maintained and verified with signature and date on RFD form UCN-20700, section W32, provided by USEC. TIDs cannot be removed without violating NCS requirements for treatment. Should a TID need to be removed, prior USEC approval must be received, with the exception of emergency conditions.

8.1.4 Exception to Section 5.2.3

Liners will be a minimum of 6-mil plastic.

8.1.5 Exception to Section 6.4

The following parameters of concern will not be provided by USEC waste offered for temporary storage in DOE storage areas: boiling point; pH of solids; pH of organic wastes; UHC determinations; and corrosivity to steel of solids.

8.1.6 Exception to Section 6

DQOs are not required, except for waste streams listed in Section 6.3.3.

8.1.7 Exception to Section 6.5

A characterization report is not required.

8.1.8 Exception to Section 7

A WGP certification statement is not applicable.

8.1.9 Exception to Section 9

USEC waste will be accompanied by a USEC container log sheet (CP-17963) in place of document UCN-20700, page 2. Accumulation start date will replace the generation start date. Weight will be provided in the Comments section of the USEC log sheet.

8.1.10 Exception to Section 6.4 and Section 4.3.2

Underlying Hazardous Constituents are not required.

8.2 ASBESTOS LEGACY WASTE

8.2.1 Modification to Section 5.1.1 and Appendix B

If the asbestos waste does not meet the landfill criteria and must be packaged for storage, then DOE will pay the incremental cost of "X" drums over DOT-compliant packaging.

8.2.2 Modification to Section 5.1.3

DOE will provide pressure relief devices if the devices are deemed necessary.

8.2.3 Asbestos DQOs

Objective

1. Determine if asbestos is acceptable at the C-746-U Solid Waste Landfill or must be managed as Low-level waste.
2. Description of Waste: Asbestos Solids
Source: Various locations at PGDP
Distribution of Contaminants: Heterogeneous, random variable
3. Analytes of Concern - Based on the source of the asbestos, a decision will be made as to whether analytes of concern are present. This decision will be documented on a PK form. The presence or absence of RCRA/PCB contaminants shall be determined by process knowledge or testing. If RCRA/PCB contaminants are present, these DQO's do not apply. The analytes of concern are; ^{241}Am , ^{231}Np , ^{238}Pu , $^{239/240}\text{Pu}$, ^{99}Tc , ^{234}U , ^{235}U , ^{238}U , ^{137}Cs , ^{230}Th , ^{228}Th , ^{232}Th , $^{89/90}\text{Sr}$, ^{60}Co , assay, and free liquids.
4. Sampling Description - Ten percent random grab samples with a minimum of four containers sampled (if available) per waste source will be used to qualify/quantify analytes of concern. Q^2 monitoring of closed containers can be substituted for Grab sampling. Sampling location/drum numbers sampled/monitored will be documented during the sampling event.

5. Analytical Methods - The following methods will be used for analysis of analytes of concern.

Analytes	Method	MDA
²⁴¹ Am, ²³⁷ Np,	Gamma/Alpha Spec	3.0 pCi/g(each series)
²³⁸ Pu, ²³⁹ Pu, ²⁴⁰ Pu,	Alpha Spec	3.0 pCi/g (each series)
²²⁸ Th, ²³⁰ Th, ²³² Th	Alpha Spec	15pCi/g
²³⁴ U, ²³⁵ U, ²³⁸ U, Total U	Gamma/ICP/TIMS/ Alpha Spec	75 pCi/g
⁹⁹ Tc	Liquid Scintillation	35 pCi/g
^{89/90} Sr	Gas Proportional Counter	15 pCi/g
¹³⁷ Cs, ⁶⁰ Co	Gamma Spec	3 pCi/g
Assay	NDA/Gamma Spec/TIMS/ICP	NA
Free Liquids	Visual inspection/Paint Filter	NA

8.3 PCB LEGACY WASTE

8.3.1 Modification to Section 5.1.1 and Appendix B

DOE will pay the incremental cost for “X” packaging over DOT-compliant packaging.

8.3.2 Exception to Section 5.1.3

DOE will provide pressure relief devices if the devices are deemed necessary.

8.4 ARSENIC, CHROMIUM, PENTACHLOROPHENOL, AND TRICHLOROETHYLENE LEGACY WASTE

8.4.1 Modification to Section 5.1.1 and Appendix B

DOE will pay the incremental cost for “ X packaging over DOT-compliant packaging.

8.4.2 Exception to Section 5.1.3

DOE will provide pressure relief devices if the devices are deemed necessary.

8.5 TRANSURANIC LEGACY WASTE

8.5.1 Modification to Section 5.1.1 and Appendix B.

DOE will pay the incremental cost for “ X packaging over DOT-compliant packaging.

8.6 PCB/ARSENIC/CHROMIUM/PENTACHLOROPHENOL/TRANSURANIC LEGACY WASTE DQOS

Objective

1. Identify legacy wastes and provide data for safe storage of legacy wastes.
2. Description of Waste: Solids and Liquids containing legacy wastes Source: Various locations at PGDP Distribution of Contaminants: Homogeneous and Heterogeneous, random variable.
3. Analytes of Concern - Based on the source of the wastes, a decision will be made as to whether analytes of concern are present. This decision will be documented on a PK form. The analytes of concern are: ²⁴¹Am, ²³⁷Np, ²³⁸Pu, ^{239/240}Pu, ⁹⁹Tc, ²³⁴U, ²³⁵U, ²³⁸U, ¹³⁷Cs, ²³⁰Th, ²²⁸Th, ²³²Th, ^{89/90}Sr, ⁶⁰Co, Assay, PCB, RCRA Characteristics, and Free Liquids.
4. Sampling Description - Sampling will be conducted if documented process knowledge does not apply to the waste. Containers will be sampled as required. It is not expected that more than one container of waste will be produced at any one time, therefore, a 100% sampling event will most likely occur. Sampling location/drum numbers sampled/monitored will be documented during the sampling event.
5. Analytical Methods - The following methods will be used for analysis of analytes of concern.

Analytes	Method	MDA
²⁴¹ Am, ²³⁷ Np,	Gamma/Alpha Spec	3.0 pCi/g (each series)
²³⁸ Pu, ²³⁹ Pu, ²⁴⁰ Pu	Alpha Spec	3.0 pCi/g (each series)
²²⁸ Th, ²³⁰ Th, ²³² Th	Alpha Spec	15pCi/g
²³⁴ U, ²³⁵ U, ²³⁸ U, Total Uranium	Gamma/ICP/TIMS/Alpha Spec	75 pCi/g
⁹⁹ Tc	Liquid Scintillation	35 pCi/g
^{89/90} Sr	Gas Proportional Counter	15pCi/g
¹³⁷ Cs	Gamma Spec	3.0 pCi/g
Assay	NDA/Gamma Spec/TIMS/ICP	NA
Free Liquids	Visual inspection/Paint Filter	NA
PCB	GC	2 ppm (oils)
RCRA Characteristics	Total TCLP Vols/Metals	
Various	(Liquids)	
	TCLP Vols/Metals (Solids)	
Free Liquids	Visual inspection/Paint Filter	NA

6. Quality Control (QC) Requirements - Field/Equipment blanks will be completed for any grab samples taken.
7. Statistical Approach - When sampling is appropriate, a description of the sampling effort will contain the statistical logic used. Statistical evaluations will be conducted in accordance with SW-846, Chapter 9 and documented.

9. RECORDS, DOCUMENTATION, AND REPORTING

Records and documentation must be created and maintained by the generator and provided to WESKEM so that the waste may be properly managed and tracked. The handling and subsequent treatment, storage, and/or disposal of hazardous waste must include a "cradle to grave" tracking of the waste material. Other associated documentation may be required depending on the waste category and/or its intended disposition. Table 1 cross-references the required documentation to the waste categories. Documents shall be prepared, reviewed, approved, controlled, and revised in accordance with Procedure OS-A-0201, *Records Management, Including Document Control*.

Table 1. Documentation by Waste Category

Documentation	Waste Category						
	Radioactive	RCRA	PCB	RCRA Mixed or PCB Low Level	Waste-water	Landfill	Scrap Metal
Assay (duplicate)	X ⁵			X ⁵		X ⁵	
Landfill Waste Approval Request and Compliance Review Checklist (Appendix M)						X	
Characterization (Analytical) Data ⁶	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ^{1,6}
Process Knowledge Documentation Form ⁷ (Appendix J)	X ²	X ²	X ²	X ²	X ²	X ²	X ²
Request for Disposal (Appendix I)	X	X	X	X	X	X	X
RFD Attachment A, Low Level Radioactive Waste (Appendix I)	X				X ⁷		
RFD Attachment B, RCRA and/or PCB Waste (Appendix I)		X	X	X	X ⁷		
RFD Attachment C, Landfill or Sanitary Waste (Appendix I)					X ⁷	X	
Waste Item Container Log (Appendix I) ³	X ³	X ³	X ³	X ³	X ³	X ³	X ³
Waste Variance Form ⁴ (Appendix K)	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴
Waste Generation Plan (Appendix A)	X	X	X	X	X	X	X
Master Landfill Disposal Log Sheet (or approved equivalent)						X	
Authorized Derivative Classifier Review	X ⁸	X ⁸	X ⁸	X ⁸		X ⁸	X ⁸

⁶ Includes HP Survey

⁷ Attachment A, B, or C may be required if wastewater is LLW; RCRA or PCB; or sanitary, respectively

⁸ Proper security classification of suspect waste required

10. REFERENCES

The following table shows references by waste categories. If waste belongs to more than one waste category, the references for all pertinent categories apply. Details of the references follow the table.

Table 2. Regulatory References

Waste Category	References			
	CFR	KAR	DOE Orders/ EPA Requirements	Policies, Permits, Agreements, etc.
Asbestos Waste	40 CFR 61 Subpart M (National Emission Standards for Hazardous Air Pollutants)	401 KAR 57:011, Asbestos Standards 401 KAR 63:042, Requirements for Asbestos Abatement Entities	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	
Landfill Waste		KAR 401, Chapter 31	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	
PCB	40 CFR 761		EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KY/EM-147, Site Treatment Plan KY/E-199, TSCA FFCA Implementation Plan
Radioactive			EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042 DOE 435.1 Radiological Control Manual (DOE/EH-0256T)	
RCRA	40 CFR 260 – 264, 268, 270	KAR 401, Chapters 30-34 & 37	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KDWM Hazardous Waste Management Permit (RCRA Permit) KY/EM-147, Site Treatment Plan
Scrap Metal			EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042 DOE 435.1	
Wastewater		KAR 401, Chapter 5:031 (Surface Water Standards)	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KPDDES Permit

10.1 REGULATIONS AND ORDERS

Code of Federal Regulations, Title 40, Parts 171, 173, 260-264, 268, 270 and 761.

Code of Federal Regulations, Title 49, U.S. Department of Transportation.

Bechtel Jacobs Company LLC, *The Site Treatment Plan Annual Update for the United States Department of Energy Paducah Gaseous Diffusion Plant Paducah, Kentucky*. KY/EM-147, March, 2000.

Martin Marietta Energy Systems, Inc. 1992. *Toxic Substances Control Act Federal Facilities Compliance Agreement Paducah Gaseous Diffusion Plant Implementation Plan*. Environmental Management Division. KYIE-119, March.

Solid Waste Landfill Regulations. *Kentucky Annotated Rules*. 401

Solid Waste Landfill Permit #073-00045, dated November 4, 1996.

U.S. Department of Energy and Bechtel Jacobs Company LLC, Kentucky Division of Waste Management Hazardous Waste Management Permit (RCRA Permit).

U.S. Department of Energy 1999. *Storage and Disposal of PCB Waste*. DOE/EH-413-9914, November.

U.S. Department of Energy 1999. *Radioactive Waste Management*. Order 435.1, July.

U.S. Department of Energy 1992. *U.S. Department of Energy Radiological Control Manual*, DOE/EH-0256T, June.

U. S. Environmental Protection Agency 1983, *Characterizing Heterogeneous Wastes: Methods and Recommendations*. EPA/600/R-92/033.

U.S. Environmental Protection Agency 1984. *Test Methods for Evaluating Solid Wastes*. EPA SW-846, GPO 955-001-00000-1, Office of Solid Waste, Washington, D.C.

U. S. Environmental Protection Agency 1989, *Methods for Evaluating the Attainment of Cleanup Standards, Volume I, Soils and Solid Media*. EPA/230-02-89-042.

APPENDIX A

Waste Generation Plan Form and Instructions

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(Project Name)
WASTE GENERATION PLAN

Waste Stream (1)	Volume (cubic feet) (2)	Container (number) (3)	Preliminary Category (4)	Characterization Method (5)	Analytes (6)	Future Disposition (7)	Generation Schedule (8)	Comments (9)

transportation, GSA management, etc, must be followed to insure proper waste management.

I have reviewed and agree to implement this waste generation plan as described.

Generator Date

Prepared by Date

I have reviewed this waste generation plan and agree that there is sufficient storage space and/or landfill/disposal capacity available to accommodate the forecasted waste materials.

BJC WOS STR Date

WESKEM, LLC Facility Operator Date

Guidelines for Completing a Waste Generation Plan

The required information needed to complete the Waste Generation Plan (WGP) is intended to be gleaned from the project specific Waste Management Plan (WMP). For this reason, each WGP must reference an approved WMP. If sampling and analysis will be used for characterization or package contaminant quantity determinations, the WGP must reference an approved Sampling and Analysis Plan. Continuation sheet may be added if additional space is needed.

Waste Stream, column 1, describes the material that will be generated during the project. Enter a brief description of the expected waste stream.

Volume, column 2, describes the forecasted quantity of material to be generated measured in cubic feet. Enter the expected volume of material to be generated.

Container, column 3, describes the type of container to be used for collecting the waste as it is generated. Enter a container that is compatible with the waste and meets the requirements of Site Operations. The container shall be authorized by DOT for the type of material. Also, enter in brackets [] the expected number of containers to be generated. Generators are reminded that BJC Engineering and Construction Services must approve all waste packaging.

Preliminary Category, column 4, describes the expected classification of the waste being generated. Enter one or more of the following: C-746-U Landfill, Scrap Metal, Wastewater, LLW, Sanitary (if not being sent to the C-746-U Landfill), RCRA (list applicable codes), or PCB. If waste meets the requirements of PCB Detectable or Asbestos Containing Material, this must also be identified.

Characterization Method, column 5, describes the method of characterization that will be used for the waste stream. Enter process knowledge including a reference to historical data or describe the sampling strategy that will be used, such as composite samples and the number and frequency of samples.

Analytes, column 6, describes the contaminants that will be analyzed for in the laboratory. Enter the specific analysis, or in the case of an established protocol, enter a reference document. If sampling and analysis is used, an approved SAP must be referenced.

Future Disposition, column 7, describes the most likely disposition for the material. Enter the targeted final disposition of the waste. This information aids in the selection of characterization method and analytes.

Schedule, column 8, describes the schedule and rate of generation. Enter the expected generation date and rate the material will be generated from that point forward.

Comments, column 9, describes any other important information about the waste being generated. Enter information that helps to describe the generating process or the waste being generated. Examples may include segregation techniques, field treatment, adsorbents to be added, etc.

APPENDIX B

Designated Containers for Typical PGDP Waste Categories

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Designated Containers for Typical PGDP Waste Categories

Note: This table identifies waste in generic categories for non-bulk packaging selection. Bulk packaging shall have WESKEM, LLC approval. Specific attributes of the waste stream must be considered to determine proper packaging

Waste Name/Type	Non- Bulk Packaging ^{1, 2}					Comments
	Packing group must meet or exceed DOT requirements and packaging must be compatible with material!					
	1A1	1A2	3H1			
Asbestos		X				Fiberboard containers are acceptable for the landfill.
Corrosive Material - liquids			X		X	
Corrosive Material - liquids						
Corrosive Material - solids						
Flammable Material - liquid	X		X		X	
Flammable Material - solid		X		X		
Miscellaneous discarded lab chemicals		X		X		In lab packs with absorbent materials
Oxidizers - liquids	X					
Oxidizers - solids		X				
PCBs - liquids	X		X		X	Self contained equipment, if intact and non-leaking
PCBs - solids		X		X		
Radioactive Material - liquids	X ³		X ³		X ³	If it is a Type A quantity material and not LSA, must be packaged in a 7A Type A package
Radioactive Material - solids		X ³		X ³		If it is a Type A quantity material and not LSA , must be packaged in a 7A Type A package
Toxic Material - liquids	X					
Toxic Material - solids		X				
Wastewater	X				X	

¹ Key to container codes: 1A1 - drum, steel, nonremovable head
 1A2 - drum, steel, removable head, with poly liner
 1H1 - drum, plastic, nonremovable head
 1H2 - drum, plastic, removable head, with poly liner
 3H1 - Jerrican, plastic, nonremovable head
 6HA1 - composite container, plastic and steel, nonremovable head

² All poly liners shall be a minimum of 10 mil thickness, unless exemption is granted by WESKEM, LLC

³ Must be strong tight packaging. Typical choices include ST-90 or B-25 metal boxes.

⁴ See DOT 49 CFR 172.101(f) for packing group determination. Contact WFSKEM, LLC for assistance if necessary.

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APPENDIX C
Characterization Report Contents

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Guidelines for Characterization Report Contents

Summary of Existing Information

- Source (Generation)
- Process Knowledge
- Existing Date
- RFDs, Container Log Sheets''

Sampling Strategy

- SAP
- DQOs
- Purpose of Characterization/Sampling Event

Sampling Event Details

- Photos
- Drum numbers, other identification (sampled ones and total population [i.e., waste stream to be characterized])
- Drum contents (observed media, free liquids, etc.)
- TIDs
- Actions taken during event

Characterization/Categorization

- Previous Description, Characterization& Categorization
- Data (new)
- Statistical Evaluations and **Summary**
- Recommended Category (including Characteristics Codes and waste profile identification)
- Logic and Rationale

Miscellaneous

- Sampling Date and Report Date
- Recommended Path Forward
- ~~Report~~ Distribution (and Acknowledgement of Review)

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APPENDIX D

Labeling and Marking

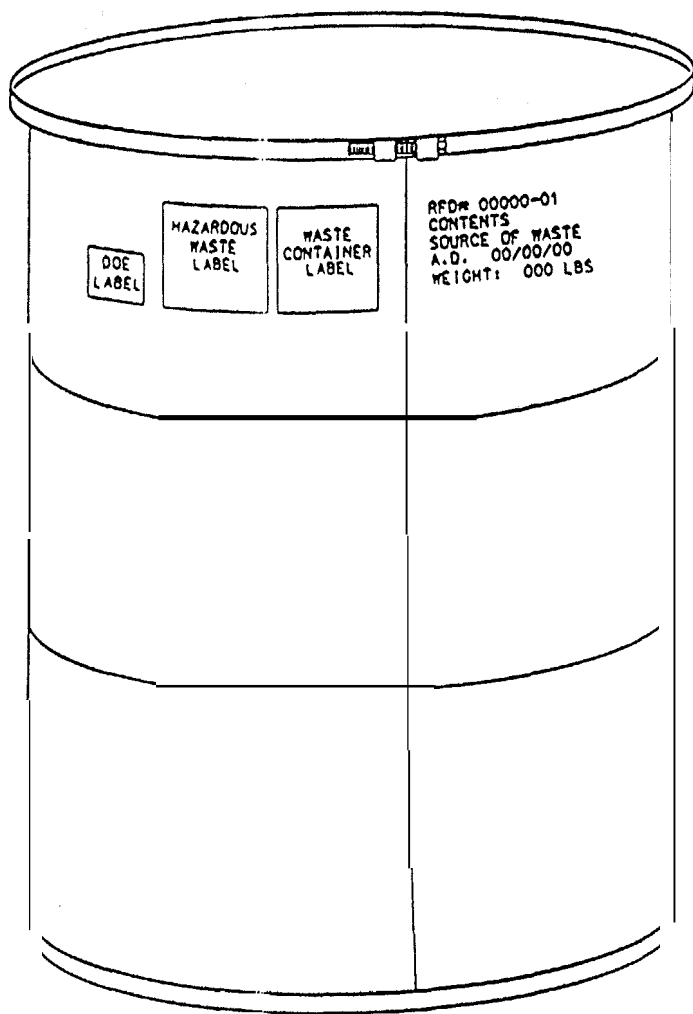
CONTENTS

Location of Labels, Markings

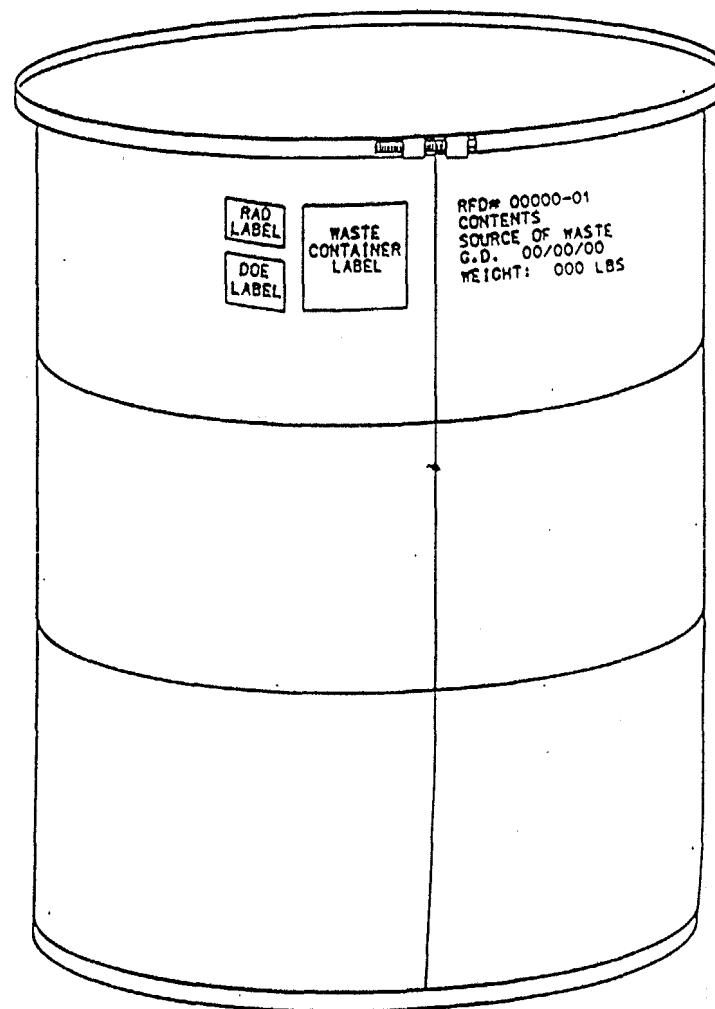
RCRA Waste Drum	D-1
Low Level Radioactive Waste Drum	D-1
Detectable PCB Waste Drum.....	D-2
PCB Waste Drum	D-2
Boxes	D-3
Waste Container Label (UCN-16387)	D-4
DOE Waste Label (UCN-19657).....	D-5
Hazardous Waste Label (UCN-18421)	D-6
PCB M _L Label (UCN- 17272b)	D-7
Detectable PCB Label (UCN-17506)	D-8
Classified Material Label (UCN-16934)	D-9
Radioactive Material Label (CP-18602)	D-9
Transuranic Waste Label (CP-21081).....	D-10
Nuclear Criticality Safety Spacing Exempt Label (CP-21837)	D-10
Fissionable Material Storage Container Label (CP-21868)	D-11
Asbestos Label	D-12
Wastewater Tank Label (UCN-19088).....	D-12
Beryllium Label	D-13

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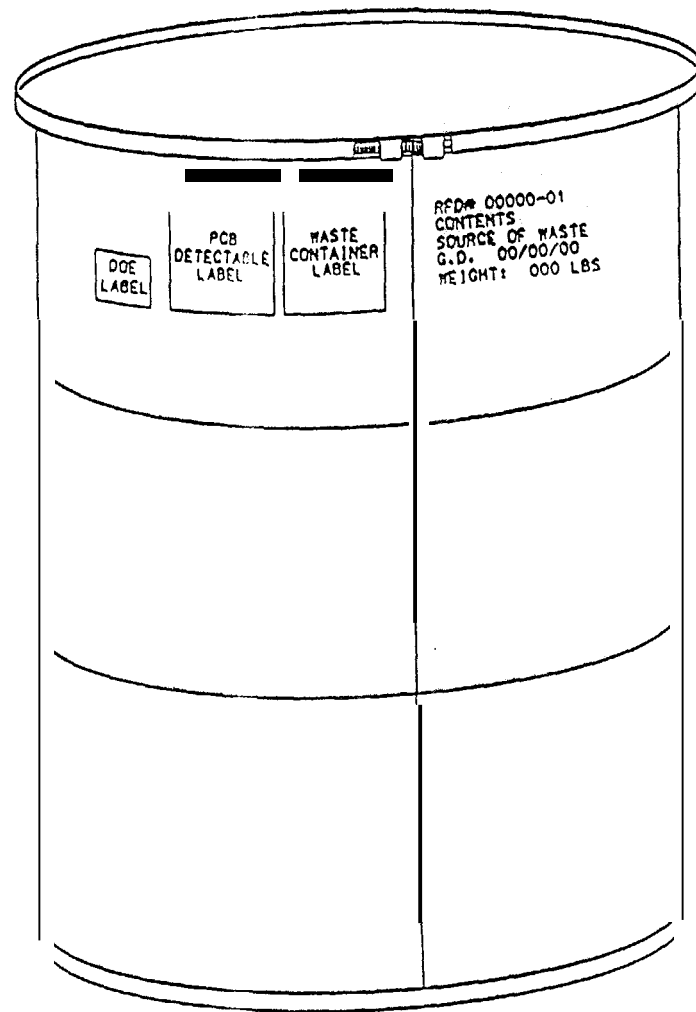
RCRA HAZARDOUS WASTE



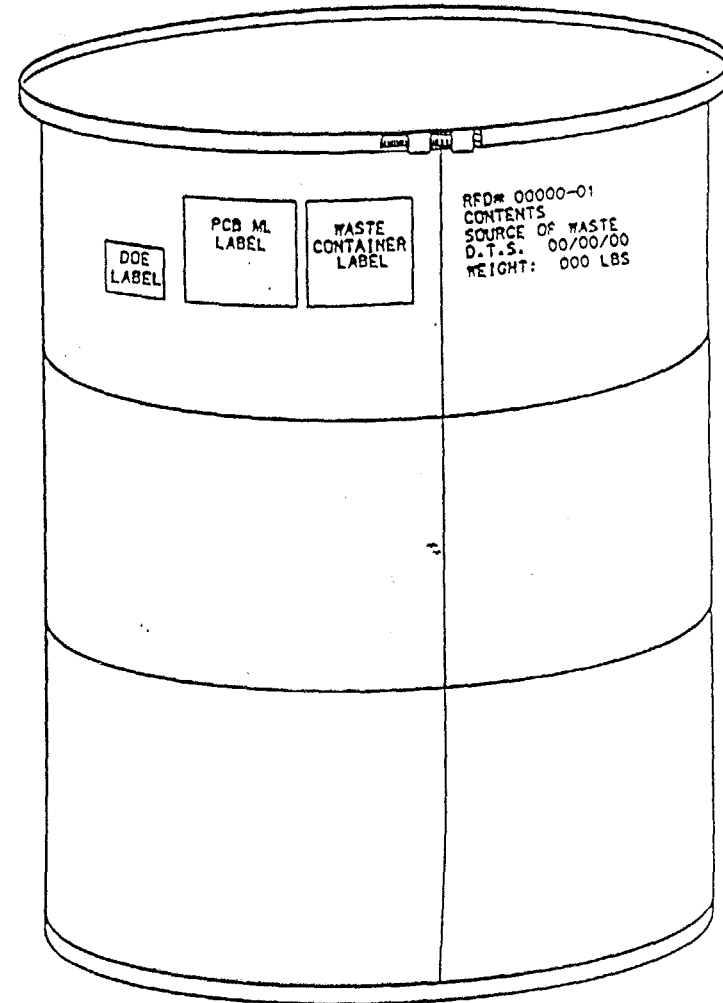
LOW LEVEL
RADIOACTIVE WASTE



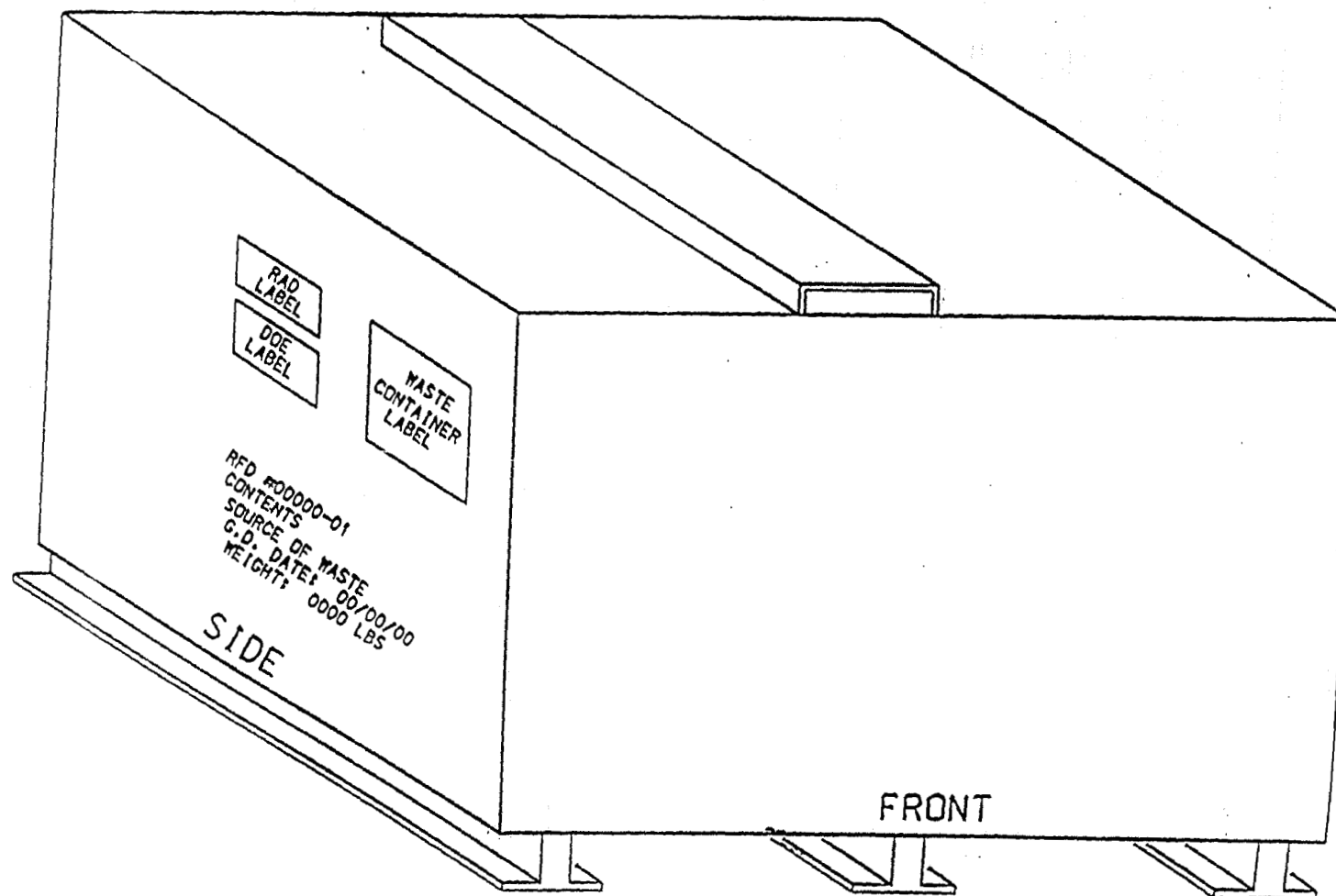
DETECTABLE PCB WASTE



PCB WASTE



BOXES



NOTE: (1) SET OF LABELS REQ'D. ON EACH SIDE OF BOX

WASTE CONTAINER LABEL	
RFD/DRUM NUMBER	_____
CONTENTS	_____ _____ _____
SOURCE OF WASTE	_____
BUILDING	_____
COMMENTS	_____ _____ _____ _____
<input type="checkbox"/> LIQUID <input type="checkbox"/> SOLID <input type="checkbox"/> SEMI-SOLID <input type="checkbox"/> COMPRESSED GAS	
GENERATION DATE	_____
UCN-16387 (5 9-90)	

Waste Container Label

DOE

UCN-19657
(5 6-93)

DOE Waste Label

D-5

91

HAZARDOUS WASTE

**FEDERAL LAW PROHIBITS IMPROPER DISPOSAL
IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY
AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY**

GENERATOR INFORMATION:

NAME

US-DOE-PADUCAH GASEOUS DIFFUSION PLANT

ADDRESS

P. O. BOX 1410

CITY

PADUCAH

STATE

KY

ZIP

42001

EPA ID NO./ MANIFEST DOCUMENT NO

KY8890008982

ACCUMULATION START DATE

EPA WASTE NUMBER

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

UCN-18421 (5 1-92)

HANDLE WITH CARE!

Hazardous Waste Label

CAUTION

CONTAINS

PCBs

(Polychlorinated Biphenyls)

A toxic environmental contaminant requiring special handling and disposal in accordance with U.S. Environmental Protection Agency Regulations 40 CFR 761 – For Disposal Information contact the nearest U.S. E.P.A. Office.

In case of accident or spill, call toll free the U.S. Coast Guard National Response Center:
800-424-8802

Also Contact: _____

Tel No.: _____

PC6R LABELMASTER® (800) 621-5808 www.labelmaster.com

PCB DETECTABLE
< 50 ppm
POLYCHLORINATED BIPHENYLS

THE CONTENTS OF THIS ITEM HAVE BEEN VERIFIED
TO CONTAIN LESS THAN 50 PARTS PER MILLION PCBs
AND GENERATED FROM A SOURCE OF < 50 ppm PCBs

PCB CONCENTRATION	
SAMPLE ID	
DATE SAMPLED	
CONTACT	PHONE NO.
UCN-17506 (12356 5-01)	

Detectable PCB Label

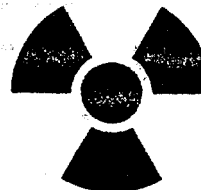
CONFIDENTIAL-RD

UCN 149 14 112 12 R+1

Classified Material Label

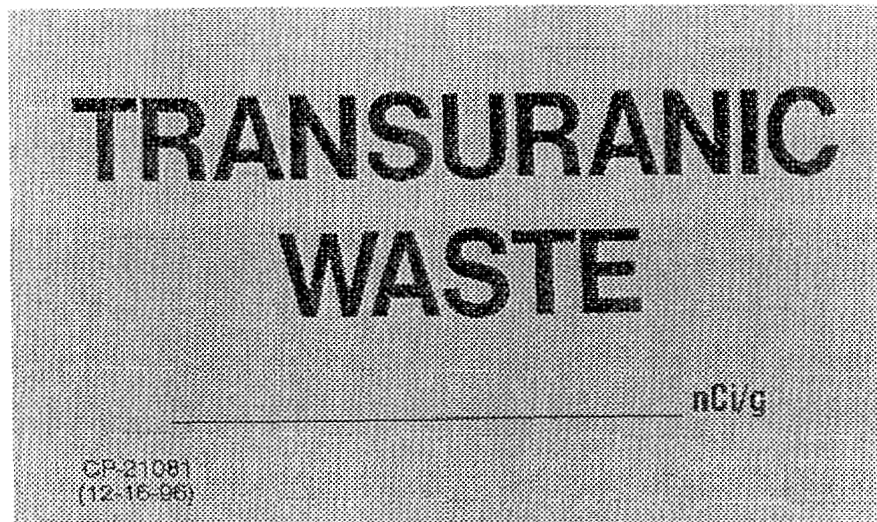


**CAUTION
RADIOACTIVE
MATERIAL**

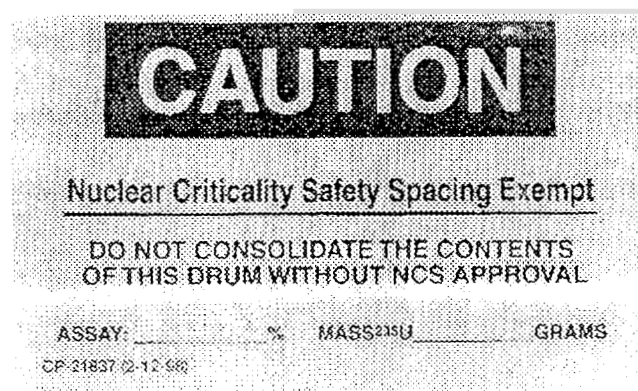


CP-18602 (5 9-94)

Radioactive Material Label



Transuranic Waste Label



Nuclear Criticality Safety Spacing Exempt Label

CAUTION



**FISSIONABLE
MATERIAL
STORAGE
CONTAINER**

RFD/DRUM NO. _____

ASSAY _____

MASS TOTAL U _____ (gU)

MASS ^{235}U _____ (g^{235}U)

CONCENTRATION _____ (gU/g OF MATERIAL)

CP-21868 (3-17-98)

Fissionable Material Storage Container Label



**CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS**

Asbestos Label

TANK LABEL

Tank Code No.: _____

Date Filled: _____

Date Sampled: _____

By: _____

Sample No.: _____

UCN-19068 (5 9-92)

Wastewater Tank Label

DANGER
CONTAMINATED WITH BERYLLIUM
DO NOT REMOVE DUST BY BLOWING OR SHAKING
CANCER AND LUNG DISEASE HAZARD

Beryllium Label

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APPENDIX E
Selection and Use of Void Fillers, Sorbents and Stabilizing Materials

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Selection and Use of Void Fillers, Sorbents and Stabilizing Materials

A variety of materials can be added as void filler to meet the void space requirements. Contact WESKEM, LLC for approved void fillers.

Sorbents and stabilizing materials can be used to meet free liquid requirements or to provide a safer waste form for handling and storage. All sorbents and stabilizing materials must be nonhazardous, compatible with the waste being sorbed or stabilized, and nonbiodegradable as defined in 40 CFR 264.314(e). Table N-1 lists the general types of sorbents and stabilizing materials that can be used for Paducah Project waste streams. Contact WESKEM, LLC for approved Sorbents/Stabilizing Material List. A generator or vendor can provide information to WESKEM, LLC to have a product added to the .Approved Sorbents/Stabilizing Materials List.

E.1 Types of Sorbents and Stabilizing Materials

The general types of sorbents and stabilizing materials allowed include the following:

- Inorganic mineral sorbents allowed for sorption include aluminosilicates, clays, vermiculite, zeolites, lime, silica, diatomaceous earth, perlite, and fly ash and other inorganic materials used for absorption.
- High molecular weight synthetic polymers (polymer sorbents) allowed for sorption include polyethylene, HDPE, polypropylene, polyacrylate, and other synthetic polymers. This excludes polymers derived from biological material (e.d., cellulose-based materials), and polymers specifically designed to be degradable.
- Stabilizing materials include concrete, Portland cement, lime/pozzolans, and a variety of other inorganic materials.
- Speciality stabilization agents for organic liquids include certain products that stabilize organic liquids. These products chemically react with organic liquids to prevent their release in the disposal environment.

E.2 Selection and Use of Sorbents and Stabilizing Materials .

Selection and use of a specific product for sorption of a given waste must address the following:

- Determine from Table E-1 what general classes of materials can be used and the conditions for use. The allowable types of sorbents for various waste streams are based on the anticipated treatment/disposal methods.
- Select a product that is approved and appropriate for the material to be treated. Waste Operations will have a current list of approved sorbents and stabilizing materials. The manufacturer will be able to provide product use information to determine whether the product could be used with the liquids intended to be sorbed or stabilized. If generators want to use a product not on the Approved Sorbents/Stabilizing Materials List, information could be obtained from the manufacturer, submitted to WESKEM, LLC for approval, and added to the list.
- Obtain manufacturer's instructions and limitations for use of the product. It is critical to use sorbents and stabilizing materials in accordance with the manufacturer's instructions. Information required includes the following:

E-1

- Compatibility of the sorbent or stabilizing material with the waste.
- The recommended ratio of sorbent to waste for the liquid being sorbed.
- For stabilizing materials, the exact ratio of liquid to stabilizing materials and methods of mixing.

It might be necessary to run a test of the waste or a surrogate to ensure that the product works adequately with the waste requiring sorption or stabilization.

E.3 Paducah Project Requirements for Use of Sorbents

Sorbents used for Paducah Waste Project TSD units must be used in sufficient quantity to meet the following requirements.

- Use twice the minimum amount of sorbent. Based on data from the manufacturer or testing, the minimum ratio of sorbent to liquid is determined.
- Sorbed waste for disposal must not release liquid under 20 pounds per square inch (138 kilopascals) pressure. A determination whether the waste will release liquids at 20 pounds per square inch (138 kilopascals) can be made from manufacturer's data or by testing. The EPA Liquid Release Test Procedure, SW-846 Method 9090 can be modified to test at 20 pounds per square inch (138 kilopascals). Other test methods can be approved by the WESKEM, LLC.
- Sorbent needs to be certified by the generator prior to use for LLW for disposal at NTS

Table E-1. Sorbent Selection Based on Waste Specification Records.

Waste Type	Subgroup	Allowable Sorbents/Stabilizing Materials	Use Requirements
Low-level waste	Low-level liquids for disposal	Mineral sorbents Polymer sorbents Stabilizing materials	Sorbents must not release liquids at 138 kilopascals (20 pounds per square inch) ¹
	Low-level organic liquids and chelating agents for disposal	stabilizing materials	
	Low-level organic liquids for storage	Polymer sorbents	
TRU waste	TRU-mixed waste	Mineral sorbents Polymer sorbents Stabilizing materials	
	TRU waste (not mixed)	Mineral sorbents Polymer sorbents Stabilizing materials	
Lab packs ²	All types	Polymer sorbents	
Mixed waste sorbed liquids, sludges, and other homogeneous solids	Aqueous waste with only D004-D011 waste	Mineral sorbents	
	Soils	Mineral sorbents Polymer sorbents	
	All others	Polymer sorbents	
Mixed waste debris	All types	Polymer sorbents	
Other mixed waste	All types	Polymer sorbents	
Mixed waste that does not require treatment prior to disposal	All types	Polymer sorbents Mineral sorbents Stabilizing materials	Sorbents must not release liquids at 138 kilopascals (20 pounds per square inch)
Leaking liquid filled equipment	All types	Matrix absorbent	Must absorb 100% of liquid present

¹ The sorbent must not release liquids when compressed at 138 kilopascals (20 pounds per square inch).

² Sorbent for lab packs is placed around containers, not mixed with liquids.

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APPENDIX F

Nuclear Criticality Safety Data Quality Objectives for Sampling and Analysis

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1. INTRODUCTION

The Data Quality Objective (DQO) process is a seven-step organizational tool. Application of the DQO process ensures that the type and amount of data needed for a project are obtained in the most cost-efficient manner. The DQO process is intended to be used on a project-specific basis. An example of this would be a specific set of DQOs for the environmental characterization of a legacy low-level waste burial site. As such, development of a set of DQOs for a program, such as the Nuclear Criticality Safety (NCS) Program, can be problematic due to the large general scope. The DQO process was adapted to be applicable to the broad aspect of obtaining samples that meet the requirements of the NCS program. These DQOs are applicable to newly generated potentially fissile waste.

When NCS-related decisions are based on analytical measurements (e.g., nondestructive assay, assay swipes, samples) of physical parameters (e.g., fissile assay, fissile mass, concentration), the following are requirements in the NCS Evaluations at Paducah Gaseous Diffusion Plant (PGDP):

1. Two independent measurements that are representative of the item sampled/measured shall be used to evaluate compliance with NCS requirements. The most conservative result from the two independent measurements shall be used to comply with the NCS requirements defined in the applicable NCS document.
 - Independence must be adequate to ensure no common mode failures exist that could result in a nonconservative decision.
 - Using two independent personnel to perform measurements satisfies the independence criteria for personnel.
 - Using two different pieces of machinery satisfies the independence criteria for machinery. Source checks or calibrations between measurements also can be used to satisfy the independence criteria for machinery as long as they eliminate common mode failures that could result in two false readings.
2. Measurement uncertainty (sample and analytical) shall be included with the reporting of any NCS significant measurement. A minimum of 2-sigma uncertainty (i.e., 95 percent confidence) is required.
3. Analytical results shall be traceable to the item sampled.

The remaining sections of this report detail the application of the DQO process to the NCS Program.

2. DESCRIPTION OF DATA QUALITY OBJECTIVES PROCESS

The DQO process provides an organized approach to development of minimum acceptable standards for data sampling and analysis. The following seven steps are used to develop these standards:

1. Develop the Problem Statement
2. Develop the Decision Statement
3. Develop the Decision Inputs
4. Develop the Study Boundaries
5. Develop the Decision Rule
6. Develop the Limits on Decision Error.
7. Design Optimization.

Specific details on the DQO process are documented in Reference 3.

3. DATA QUALITY OBJECTIVES RESULTS

The DQO process outlined in Section 2 was used for the development of minimum acceptable standards for data sampling and analysis. A summary of the DQO team's application of the seven steps in the DQO process is provided in the following list:

1. Problem Statement: "We have various items/materials that must be characterized in accordance with NCS requirements."
2. The Decision: The decision to be made following NCS sampling and analyses is how to manage the material.
3. Decision Inputs: Several questions arose from the team's discussion of this step and are documented in Appendix A.
4. Study Boundaries: This step was determined to be not applicable since the materials under consideration are containerized.
5. Decision Rule: This step was determined to be not applicable for the process as applied.
6. Limits on Decision Error: The goal of the DQOs was to develop guidance that may be used by project managers to design sampling **and** analyses that meet the following goals:
 - a. The collection of two independent representative samples, and
 - b. The elimination of, to the extent practical, common mode failure.
7. Design Optimization: For each material type, process knowledge applied to the design of the sampling and analyses is documented in Appendix B.

4. CONCLUSIONS

A set of DQOs has been developed for use in sampling and analytical methods that produce data used in making NCS decisions at the Paducah Gaseous Diffusion Plant. The application of the project-based DQO process was adapted to be applicable to the large general scope of the NCS Program. The defined process meets the requirements and expectations of the NCS Program by providing the means to acquire reliable sample data. A set of DQOs was successfully completed and is provided.

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Waste Stream Process Knowledge

WASTE STREAM PROCESS KNOWLEDGE

SOLID TRAP MIX MATERIALS

- Sodium Fluoride Trap Mix
- Magnesium Fluoride Trap Mix
- Alumina Trap Mix

Basis: Waste trap mix is heterogeneous with respect to enrichment. This heterogeneity is due to the enrichment process creating a gradient of enrichment values and the mechanics of the trapping process. This is applicable to most traps within the process and is compounded by the fact that the waste within a waste container may originate from more than one trap (source).

Waste trap mix also is heterogeneous with respect to uranium concentration. This heterogeneity is due to the nature of the trapping process. The uranium loading or concentration within the waste trap mix is seldom uniformly distributed. In addition, the fact that the waste within a waste container may originate from more than one trap (source) also introduces another element of variability. However, the gradient of uranium concentrations is only in the vertical direction. There is no mechanism that is envisioned that would cause the uranium concentration to vary on the horizontal plane within a waste container. Thus, a core sampling technique is appropriate.

GENERAL LIQUID/SLUDGE MATERIALS

- Degreaser Solvents
- Filtrate from C-400 Dissolver and C-409 Uranium Recovery
- Solution from C-400/C-409 Storage Tanks
- Spray Booth Solution
- Laboratory Solutions
- Cylinder Wash Sludge
- Spray Booth Sludge
- Uranium Precipitate (C-400 Dissolver and C-409 Uranium Recovery)

Basis: Waste solutions from C-400 and C-409 processes are homogenous with respect to enrichment. This homogeneity is due to the nature of solutions and the fact that the solutions are inherently mixed during the waste generation and treatment processes.

Waste solutions from the C-400 and C-409 processes are heterogeneous with respect to uranium concentration. However, the gradient of uranium concentrations is only in the vertical direction. There is no mechanism that is envisioned that would cause the uranium concentration to vary on the horizontal plane within a waste container. Thus, a core sampling technique is appropriate. Materials that have two phases will require concentration samples from both phases.

POTENTIALLY FISSILE OILS

- Seal Exhaust Stations
- Kinney Pumps
- Normetex Pumps
- Vacuum Pumps

Basis: Provided the oil from these sources is free flowing and can be mixed, it is similar to the waste solutions from the C-400 and C-409 processes and it is homogenous with respect to enrichment. This homogeneity is due to the nature of solutions and the fact that the solutions are inherently mixed during the waste generation and treatment processes. Contaminated oil **may** be heterogeneous with respect to uranium concentration; however, the gradient of uranium concentrations is only in the vertical direction. There is no mechanism that is envisioned that would cause the uranium concentration to vary on the horizontal plane within a waste container. Thus, a core sampling technique is appropriate.

OTHER SOLID MATERIALS

- Vacuum Dust
- Slugged Oil
- Lab Waste – Unknown Source
- Lab Waste – Known Source
- Filters (from Negative Air Machines)
- Spill Clean-Up Waste

Vacuum Dust

Basis: The variability of the waste that can be accumulated with a vacuum cleaner precludes the establishment of a Data Quality Objective (DQO) for this waste stream..

Slugged Oil

The viscosity of slugged oil varies greatly and is dependent upon the concentration of the uranium. Since the slugged oil is not necessarily free flowing like a solution, it can not be assumed to be homogenous. In addition, the fact that the waste within a waste container may originate from more than one source also introduces another element of variability.

Laboratory Waste – Unknown Source

Basis: The variability of the waste that can be accumulated with solid laboratory waste precludes the establishment of a DQO for this waste stream..

Laboratory Waste – Known Source

Basis: Solid Laboratory Waste is heterogeneous **with** respect to enrichment. This heterogeneity is due to the enrichment process creating a gradient of enrichment values and is compounded by the fact that the waste within a waste container may originate from more than one source

Filters (from Negative Air Machines)

Basis: The uranium loading on filters consists of a relatively thin layer over a large surface area. The enrichment across a single filter is anticipated to be homogenous. The use of swipes and the associated lab analysis is applicable to determining the enrichment.

The determination of the amount of uranium contamination on a filter can be accomplished using nondestructive assay or a method, which measures the weight of the filter prior to and following the loading of the filter. However, the techniques themselves must be verified to be applicable and approved prior to use.

Spill Clean-Up Waste

Basis: The variability of the waste that can be accumulated during spill clean up precludes the establishment of a DQO for this waste stream.

Trap Mix: Alumina, Sodium Fluoride, and Magnesium Fluoride					
Assay Samples	Number of Samples	Assume maximum applicable plant assay			
	Sample Type	N/A			
	Sample Technique	N/A			
	Analytical Method	N/A			
Mass/ Conc. Samples	Number of Samples	2 independent surveys	OR	2 independent samples from every drum ①	AND ② 1 survey (confirmatory sampling)
	Sample Type	N/A		Full cores (single)	N/A
	Sample Technique	N/A		Mix core; collect 2 sample(s)	N/A
	Analytical Method ③	NDA	Homogenize each sample then analyze each sample by alpha, TIMS, ICP/MS, or acid leach and gamma		NDA

**Sludge: Cylinder Wash, Spray Booth, and Uranium Precipitate
(400/409)**

Assay Samples	Number of Samples	2 independent surveys	OR	Assume maximum applicable plant a: ay	OR	2 independent
	Sample Type	N/A		N/A		Full core (single)
	Sample Technique	N/A		N/A		Mix core, collect 2 samples ④
	Analytical Method	NDA		N/A		Analyze by alpha, TIMS, ICP/MS, or acid leach and gamma ⑤
Mass/ Conc. Samples	Number of Samples	2 independent surveys	OR	2 independent samples from every drum ①	AND ②	1 survey (confirmatory sampling)
	Sample Type	N/A		Full cores (single)		N/A
	Sample Technique	N/A		Mix core; collect 2 samples		N/A
	Analytical Method ③	NDA		Analyze by alpha, TIMS, ICP/MS, or acid leach and gamma		NDA

Solid: Vacuum Dust from Fissile Operations and Fissile Spill Cleanup Materials						
Assay Samples	Number of Samples	See NCS for guidance				
	Sample Type					
	Sample Technique					
	Analytical Method					
Mass/ Conc. Samples	Number of Samples	2 independent surveys	OR	2 independent samples from every drum ①	AND ② 1 survey (confirmatory sampling)	
	Sample Type	N/A		Full cores (single)		N/A
	Sample Technique	N/A		Mix core; collect 2 sample(s)		N/A
	Analytical Method ③	NDA		Homogenize each sample then analyze by alpha, TIMS, ICP/MS, or acid leach and gamma		NDA

Solid: Lab Waste – Unknown Source						
Assay Samples	Number of Samples	See NCS for guidance				
	Sample Type					
	Sample Technique					
	Analytical Method					
Mass/ Conc. Samples	Number of Samples	2 independent surveys				
	Sample Type	N/A				
	Sample Technique	N/A				
	Analytical Method ③	NDA				

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Solid: Lab Waste - Known Source									
Assay Samples	Number of Samples	Assume maximum applicable plant assay or use existing data per sample							
	Sample Type	N/A	OR	Use existing data					
	Sample Technique	N/A							
	Analytical Method	N/A							
Mass/Conc. Samples	Number of Samples	2 independent surveys	OR	Use existing data					
	Sample Type	N/A							
	Sample Technique	N/A							
	Analytical Method ③	NDA							

Solid: Filters (HEPA from NAMs)

Note: Sampling and analyses required for every filter.

Assay Samples	Number of Samples	Assume maximum applicable plant assay	OR	2 independent samples		
	Sample Type	N/A		Wipes		
	Sample Technique	N/A		Submit 2 samples comprised of 3 wipes per sample		
	Analytical Method	N/A		Analyze by alpha, TIMS, ICP/MS, or acid leach and gamma.		
Mass/ Conc. Samples	Number of Samples	2 independent surveys	OR	Weigh filter before and after use; assume difference is uranium ⑥		
	Sample Type	N/A				
	Sample Technique	N/A				
	Analytical Method ③	NDA				

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Solid: Slugged Oil									
Assay Samples				Mass/ Conc. Samples					
Number of Samples		Sample Type		Sample Technique		Analytical Method		Number of Samples	
Assume maximum applicable plant assay		N/A		N/A		N/A		2 independent samples	
		N/A		N/A		N/A			
		Full core		Mix core; collect 2 sample(s)		Any applicable			

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Liquid (no solid): Cylinder Wash Solutions, Degreaser Solvents, Filtrate Solutions (400/409), Solution from 400/409 Storage Tanks, Spray Booth Solution, Lab Solutions, and Oils from Seal Exhaust Stations, Kinney Pumps, Normetex Pumps, or Vacuum Pumps ⑦

Assay Samples					Mass/ Conc. Samples				
Number of Samples	Sample Type	Sample Technique	Analytical Method	OR	Number of Samples	Sample Type	Sample Technique	Analytical Method	
2 independent surveys	N/A	N/A	NDA		2 independent surveys	N/A	N/A	NDA	
				OR	Mix sample; analyze 2 samples ④	Full core	Mix, collect, and submit 1 sample	Mix core; analyze 2 samples ④	

- ① If core cannot be collected, obtain two independent nondestructive assay (NDA) measurements.
- ② If mass > 15 g, confirm with NDA
- ③ Calibrate instrument before, between, and after measurements
- ④ If two separate matrices; pull 2 independent samples from each matrix.
- ⑤ If there are two phases, analyze each phase separately
- ⑥ Weigh with same scales, calibrated & documented, assuming all accumulation is fissile.
- ⑦ Use maximum phase assay or concentration and apply to full drum

APPENDIX G

RESERVED

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APPENDIX H

RESERVED

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APPENDIX I

RFD and Associated Forms

CONTENTS

RFD Form (BJCF-515a)	I-1
Waste Item Container Log Sheet (UCN-20700)	I-2
RFD Attachment A Low-Level Radioactive Waste	I-3
RFD Attachment B RCRA and/or TSCA Waste	I-4
RFD Attachment C Sanitary Waste, Landfill Waste, or Non-Regulated Water	I-5
Constituent Continuation Page	I-6
Instructions -	
RFD	I-7
Waste Item Container Log Sheet	I-11
Attachment A	I-13
Attachment B	I-16
Attachment C	I-20

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Request For Disposal

Document ID Number

118001

Generation Process Information (Completed by Generator)									
W1. Generator's Name (Print)		W2. Badge No.		W3. Generator's Phone No.		W4. Mail Stop		W5. Charge No./WO	
W6. Generator's Company		W7. Corp Owner		W8. Origin Site		W9. Origin Facility		W10. Origin Area	
W11. Rad Area?									
<input type="checkbox"/> Yes <input type="checkbox"/> No									
W12. Number of Items		W13. Process Category (GCC)		W14. Process Activity Code		W15. AWA Number		W16. Physical Form	
W17. Material Type		W18. Holding Site		W19. Holding Facility		W20. Holding Area		W21 RFD Attachment	
								<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	
Waste Subcategories (Check all that apply)									
W22. Biological		W25. Const. Debris		W28. Non-Friable Asbestos		W31. DMSA			
W23. Accountable		W26. Classified		W29. TRU Waste					
W24. Carcinogen		W27. Friable Asbestos		W30. CERCLA					
Description / Comments									
W32.									
This is to certify that the above named materials properly described and in the stated container, which is in good condition, marked with the RFD number, content, appropriate generation date, and at the time of location.									
W33. Generation Plan Number		W34. Generator's Signature				Date			
Handling / Pickup Information (Completed by Waste Management)									
P1. Pick-up Site		P2. Pick-up Facility				P3. Pick-up Room/Area			
P4. PPE Requirements									
P5. Container-Labeling Requirements									
<div><div><input type="checkbox"/> RCRA <input type="checkbox"/> FISSILE <input type="checkbox"/> FLAMMABLE <input type="checkbox"/> ASBESTOS</div><div><input type="checkbox"/> PCB <input type="checkbox"/> NCS EXEMPT <input type="checkbox"/> COMBUSTIBLE <input type="checkbox"/> REACTIVE</div><div><input type="checkbox"/> DET PCB (detected in & source <50ppm) <input type="checkbox"/> RD CONFIDENTIAL <input type="checkbox"/> OXIDIZER <input type="checkbox"/> TRANSURANIC</div><div><input type="checkbox"/> RAD <input type="checkbox"/> ACID <input type="checkbox"/> BASE <input type="checkbox"/> NON-HAZ</div><div><input type="checkbox"/> DOE <input type="checkbox"/> USEC <input type="checkbox"/> WESKEM</div></div>									
P6. Additional Handling Instructions						Reference FWR			
						Origin Date			
						PCB Start Date			
						RCRA Start Date			
P7. Waste Coordinator (Issued By)		Badge		Date		P8. Disposal/Storage Completed By		Badge	
								Date	
P9. Field Supervisor		Badge		Date		P10. Data Processing Completed By		Badge	
								Date	
P11. Waste Item Information						P12. Operator Comments			
Waste Item Number _____									
Container Number (Bar Code) _____									
Weight _____									
Location and Grid _____									
Container Size _____									

Waste Item Container Log

[illegible]

Low-Level Radioactive Waste

Attachment A

Document ID Number

Prohibited Items							
		Yes	No			Yes	No
A1. Pyrophoric Materials (Other than radioactive forms of isotopes)				A6. Ignition Sources			
A2. Active Corrosive Agents				A7. Free Liquids (Unless Wastewater)			
A3. TRU Radioactive Material				A8. RCRA Waste			
A4. Explosive Materials				A9. TSCA Waste			
A5. Etiological Agents							
A10. Waste Variance Request Number(s)							
Additional Waste Characteristics							
		Yes	No			Yes	No
A11. Chelating Agents				A13. Detectable PCB (Concen and Source <50 ppm)		Conc.	ppm
A12. ION Exchange Resins				A14. Waste			
Radioisotope Determination Method							
Document Type				Document Number			
R1. Analysis Sample Id No.							
R2. Process Knowledge Form No.							
R3. Fissile Content (Wt% U-235)	R4. Grams U-235	R5. <input type="checkbox"/> Yes <input type="checkbox"/> No		R6. Chemical Form			
Other Sample Analysis							
Document Type				Document Number			
O1. Analysis Sample Id No.							
O2. Process Knowledge Form No.							
Radiation Data From Health Physics Survey Surface Contamination (Data Supplied by HP)							
R7. HP Survey <input type="checkbox"/>		<input type="checkbox"/> Yes <input type="checkbox"/> No					
R8. Transferable <input type="checkbox"/>				R9. Fixed (Alpha) <input type="checkbox"/>			
				dpm/100cm ²			
R10. Transferable <input type="checkbox"/>				R11. Fixed (Beta/Gamma) <input type="checkbox"/>			
				dpm/100cm ²			
R12. External <input type="checkbox"/> Contact				R13. Dose Rate			
MREM/HR				MREM/HR @ Meters (B/G)			
R14. HP Signature				R15. Survey Number			

Toxic Substances Control Act (TSCA) Waste

Document ID Number

Attachment B

Prohibited Items		Additional Waste Characteristics				
B1. Chemically Incompatible Substances <input type="checkbox"/> Yes <input type="checkbox"/> No	B3. Chelating Agents <input type="checkbox"/> Yes <input type="checkbox"/> No	B4. Ion Exchange Resins <input type="checkbox"/> Yes <input type="checkbox"/> No	B5. pH	B6. Corrosivity to Steel mm		
B2. Waste Variation Request Number(s)	B7. Flashpoint C F	B8. Boiling Point C F	B9. Detectable PCB (Source <50 ppm) <input type="checkbox"/> Yes <input type="checkbox"/> No	Conc. ppm	B10. Wastewater <input type="checkbox"/> Yes <input type="checkbox"/> No	
B11. Radioactive <input type="checkbox"/> Yes <input type="checkbox"/> No						
Radioisotope Determination Method						
Document Type		Document Number(s)				
R1. Analysis Sample ID Number						
R2. Process Knowledge Form Number						
R3. Fissile Content (Weight % U-235)	R4. Grams U-235	R5. NCS Exempt <input type="checkbox"/> Yes <input type="checkbox"/> No	R6. Chemical Form			
RCRA TSCA Determination Method						
Document Type		Document Number(s)		Determination		
T1. Analysis Sample ID Number				T3. RCRA Waste <input type="checkbox"/> Yes <input type="checkbox"/> No		
				T4. TSCA Waste <input type="checkbox"/> Yes <input type="checkbox"/> No		
T2. Process Knowledge Form Number				T5. Underlying Hazardous Constituents <input type="checkbox"/> Yes <input type="checkbox"/> No		
T6. PCBs Present <input type="checkbox"/> Yes <input type="checkbox"/> No	T7. PCB Concentration ppm	T8. PCB Source Concentration ppm	T9. PCB Source Concentration Range <input type="checkbox"/> 50-499.99ppm <input type="checkbox"/> >=500ppm			
T10. Known Hazardous Constituents						
T11. Known Underlying Hazardous Constituents						
Radiation Data from Health Physics (HP) Survey Source Contamination (Data Supplied by HP)						
R7. HP Survey Required <input type="checkbox"/> Yes <input type="checkbox"/> No						
R8. Transferable (Alpha) dpm/100cm ²		R9. Transferable (Alpha) dpm/100cm ²				
R10. Transferable (Beta/Gamma) dpm/100cm ²		R11. Transferable (Beta/Gamma) dpm/100cm ²				
R12. External Dose/Package Contact mrem/hr		R13. Dose Rate mrem/hr @ meters (B/G)				
R14. HP Signature		R15. Survey Number				
Regulatory Codes (Completed by Waste Management Unit)						
X1. PCB Item <input type="checkbox"/> A <input type="checkbox"/> AC <input type="checkbox"/> B <input type="checkbox"/> C	X2. Waste Stream ID	X3. Form Code	X4. Source Code			
X5. Handling Code	X6. LDR Code	X7. Reactivity Group Number	X8. Generated from a Non-RMMA <input type="checkbox"/> Yes <input type="checkbox"/> No			
X9. Substance ID	X10. Concentration	X11. Units	X12. EPA Code(s)	X13. Underlying Hazardous Constituents		
X9. Substance ID	X10. Concentration	X11. Units	X12. EPA Code(s)	X13. Underlying Hazardous Constituents		
X14. Substance Name						
X15. Constituent Continuation Sheet(s) <input type="checkbox"/> Yes <input type="checkbox"/> No through						

SANITARY WASTE, LANDFILL WASTE, OR NON-REGULATED WATER

ATTACHMENT C

DOCUMENT ID NUMBER

PROHIBITED ITEMS			
C1. RCRA WASTE <input type="checkbox"/> YES <input type="checkbox"/> NO	C2. TSCA WASTE <input type="checkbox"/> YES <input type="checkbox"/> NO	C3. LLW - TOTAL URANIUM >30 pCi/g <input type="checkbox"/> YES <input type="checkbox"/> NO	C4. FREE LIQUIDS (Unless Wastewater) <input type="checkbox"/> YES <input type="checkbox"/> NO
C5. DETECTABLE PCB? (Soil <50 ppm) <input type="checkbox"/> YES <input type="checkbox"/> NO		C6. WASTE VARIANCE REQUEST NUMBER(s)	
RADIOISOTOPE DETERMINATION METHOD			
DOCUMENT TYPE		DOCUMENT NUMBER	
R1. ANALYSIS SAMPLE ID NO.			
R2. PROCESS KNOWLEDGE FORM NO.			
OTHER SAMPLE ANALYSIS			
DOCUMENT TYPE		DOCUMENT NUMBER	
O1. ANALYSIS SAMPLE ID NO.			
O2. PROCESS KNOWLEDGE FORM NO.			
RADIATION DATA FOR HEALTH PHYSICS SURVEY SURFACE CONTAMINATION (Data supplied by HP)			
R7. HP SURVEY REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO			
R8. TRANSFERABLE (Alpha) dpm/100cm ²		R9. FIXED (Alpha) dpm/100cm ²	
R10. TRANSFERABLE (Beta/Gamma) dpm/100cm ²		R11. FIXED (Beta/Gamma) dpm/100cm ²	
R12. EXTERNAL DOSE/PACKAGE CONTACT MREM/HR		R13. DOSE RATE MREM/HR @ METERS (B/G)	
R14. HP SIGNATURE		R15. SURVEY NUMBER	

CONSTITUENT CONTINUATION SHEET

DOCUMENT ID NUMBER

(Continuation Page of)

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X14 SUBSTANCE NAME

X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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X9 SUBSTANCE ID	X10 CONCENTRATION	X11 UNITS	X12 EPA CODE(s)	X13 UNDERLYING HAZ CONSTITUENTS
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REQUEST FOR DISPOSAL

NOTE: All fields must be addressed and a response provided for each field.

Document ID Number – The unique identifier applied to the Request for Disposal.

GENERATION PROCESS INFORMATION (TO BE COMPLETED BY GENERATOR)

- W1. Generator's Name (Print) – The printed name of the individual responsible for generation of the waste. Initials for first and middle names may be used.
- W2. Badge Number – The badge number of the individual indicated in block W1.
- W3. Generator's Phone # - The phone number, including the area code if other than 270, where the individual indicated in block W1 may most likely be reached. A four or seven digit number is acceptable.
- W4. Mail Stop – The mail stop of the individual indicated in W1.
- W5. Charge No. / WO – A valid work order or charge number that may be used for charges associated with waste handling activities. Mandatory.
- W6. Generator's Company – The Company employing the individual indicated in W1 (e.g., WESKEM, CDM, GEO, etc.).
- W7. Corp. Owner – This is the corporation or federal agency who owns the waste (e.g., USEC, DOE).
- W8. Origin Site – The site where the waste was generated, if not a facility.
- W9. Origin Facility – The facility or building where the waste was generated.
- W10. Origin Area – The room, area, lab or location where the waste was generated.
- W11. Rad. Area – Indicate whether or not the area indicated in W10 is a radiological area. A radiological area is defined in 70CFR 835.603 as any area within a "controlled area" which meets the definition of a "radiation area", "high radiation area", "very high radiation area", "airborne radioactivity area", "contamination area", or "high contamination area."
- W12. Number of Items – The number of items on the RFD. For example, 2 drums or 2 capacitors. This does not mean the number of individual items within a container.
- W13. Process Category (GCC) - Formerly referred to as Generation Cause Code. A three digit alphanumeric code identifying the type of generation of the waste that is critical to the waste minimization effort.
- | | | | |
|-----|--|-----|--------------------------------------|
| ABT | Abatement | PRO | Ongoing Process / Production (GCC 1) |
| CON | Construction / Demolition | REC | Recycled |
| DND | Decommission / Decontamination (GCC 4) | REM | Remediation (GCC 5) |
| EXC | Ongoing Out-of-Spec / Excess Material | RND | Research / Development |
| LEG | Legacy | RPK | Repackaging |
| MNT | Ongoing Maintenance | SPL | Spills (GCC 2) |
| MUL | Multiple | TRE | Treatment |
| OTP | One-time Planned (GCC 3) | UNK | Unknown / Other (GCC 6) |
- W14. Process Activity Code – A three digit alphanumeric code indicating the process, which produced the waste. A list of available Process Activity Codes is defined on the following page.
- W15. AWA Number – This is the Asbestos Work Authorization Number. If W27 or W28 are yes, this block must have a number.
- W16. Physical Form – This is the physical form of the waste stream (liquid, solid, slurry, sludge, gas, emulsion).

Process Activity Code (block W14)

CLEANING & DEGREASING

A01	Stripping
A02	Acid Cleaning
A03	Caustic (Alkali) Cleaning
A04	Flush Rinsing
A05	Dip Rinsing
A06	Spray Rinsing
A07	Vapor Degreasing
A08	Physical Scraping & Removal
A09	Clean Out Process Equipment
A19	Other Cleaning & Degreasing

SURFACE PREPARATION & FINISHING

A21	Painting
A22	Electroplating
A23	Electro less Plating
A24	Phosphating
A25	Heat Treating
A26	Pickling
A27	Etching
A29	Other Surface Coating/Preparation

PROCESS OTHER THAN SURFACE PREP.

A31	Product Rinsing
A32	Product Filtering
A33	Product Distillation
A34	Product Solvent Extraction
A35	By-product Processing
A36	Spent Catalyst Removal
A37	Spent Process Liquids Removal
A38	Tank Sludge Removal
A39	Slag Removal
A40	Metal Forming
A41	Plastics Forming
A49	Other Process other than surface prep.

ONE TIME & INTERMITTENT PROCESS WASTES

A51	Leak Collection
A52	Leachate Collection
A53	Cleanup of Spill Residues
A54	Oil Changes
A55	Filter / Battery Replacement
A56	Discontinue use of Process Equipment
A57	Discarding Off-Spec Material
A58	Discarding Out-of-Date Products or Chemicals
A59	Other production-derived one-time processes
A60	Sludge Removal

WASTE FROM REMEDIAL ACTIVITIES

A61	Superfund remedial action
A62	Superfund emergency response
A63	RCRA Corrective action at SWMU
A64	RCRA Closure of Hazardous Waste Management Unit
A65	Underground storage tank cleanup
A69	Other Remediation

POLLUTION CONTROL / WASTE TREATMENT

A71	Filtering / Screening
A72	Metals Recovery
A73	Solvents Recovery
A74	Incineration / Thermal Treatment
A75	Wastewater Treatment
A76	Sludge Dewatering
A77	Stabilization
A78	Air Pollution Control Devices
A79	Other Pollution Control or Waste Treatment

OTHER PROCESSES

A91	Clothing & Personal Protective Equipment
A92	Routine Cleanup Waste (e.g. Floor Sweepings)
A93	Closure of management units or equipment other than by remediation (A61-A69)
A94	Laboratory Wastes
A99	Other Process
UNK	Unknown

- W 17. Material Type(s) – Based on the physical form given in W 16, indicate the five digit alphanumeric code for up to three subcategories of materials that describe the actual makeup of the waste stream. At least one subcategory must be chosen, and the primary material type should be listed first.

SOLID

MT001-	Absorbent
MT002-	Biological
MT003-	Cloth
MT004-	Equipment
MT005-	Glass
MT006-	Granular
MT007-	Metallic
MT008-	Paper
MT009-	PPE
MT010-	Plastic
MT011-	Rubble
MT012-	Soil
MT013-	Wood
MT014-	Filter Cake
MT015-	Powder
MT016-	Solidified Liquid

GAS

MT101-	Compressed
MT102-	Liquefied

LIQUID

MT200-	Groundwater
MT201-	Oil-Based
MT202-	Solvent, Halogenated
MT203-	Solvent/ Non-Halogenated
MT204-	Water-Based
MT205-	Wastewater
MT206-	Well water
MT299-	Other Liquid

EMULSION

MT800-	Oil-Based
MT801-	Water-Based

SLUDGE

MT400-	Biological
MT401-	Oil-Based
MT402-	Metallic
MT403-	Soil
MT404-	Water-Based
MT405-	Thermally Treated
MT499-	Other Sludge

SLURRY

MT600-	Biological
MT601-	Oil-Based
MT602-	Metallic
MT603-	Soil
MT604-	Solvent Halogenated
MT605-	Solvent, Non-Halogenated
MT606-	Water-Based

MT099- Other Solid

MT899- Other Emulsion

MT699- Other Slurry

- W18.** Holding Site – Indicate the site where the waste is physically located.
- W19.** Holding Facility – Indicate the facility or building where the waste is physically located.
- W20.** Holding Area – Indicate the room, area, lab or location where the waste is physically located.
- W21.** RFD Attachment – Indicate the letter **A, B** or **C** for the appropriate attachment completed for the waste.

WASTE SUBCATEGORIES (Check all that apply)

Indicate any subcategories that apply to the waste item. "No" is acceptable for all subcategories.

- w22.** Biological – indicate if the waste stream contains materials of biological origin. Examples include animal carcasses, shrubs, trees and animal bedding.
- w23.** Accountable – Indicate if the waste stream is part of the Nuclear Materials Control and Accountability Program (NMC&A). If "Yes", transfer forms may also be required.
- w24.** Carcinogen – Indicate if the waste stream contains known carcinogens. Carcinogens are substances that cause the development of cancerous growths in living tissue., such as asbestos. For assistance, refer to the MSDS or contact IH.
- w25.** Construction Debris – Indicate if the waste was generated as a result of construction activities.
- W26.** Classified – Indicate if the waste stream contains any classified materials.
- w27.** Friable Asbestos – Indicate if the waste contains friable asbestos. If "Yes", **w15** must be completed.
- w28.** Non-Friable Asbestos – Indicate if the waste contains non-friable asbestos. If "Yes", **w15** must be completed.
- w29.** TRU Waste – Indicate if the waste stream contains Transuranic materials.
- w30.** CERCLA – Indicate if the waste is considered CERCLA waste.
- w31.** DMSA - Indicate if the waste was generated from a DMSA (DOE Material Storage Area).
- w32.** Waste Description and Comments – Provide a general description of the waste material that is associated with codes used in **w17** (i.e. **PPE** in a plastic bag). As applicable, indicate whether chemicals or wastes are "spent" or "unused". This notation should be made in the description with the name of the chemical or waste.
- w33.** Generation Plan# (Optional) – This is a number provided by the Generator Company for tracking purposes only.
- w34.** Generator Signature & Date – The generator indicated in **W1** must sign and date the RFD.

HANDLING/PICKUP INFORMATION (To be completed by Waste Management)

- P1.** Pickup Site – Indicate the site where the waste is physically located for pickup.
- P2.** Pickup Facility – Indicate the facility or building where the waste is physically located for pickup.
- P3.** Pickup Room/Area – Indicate the room, area, lab or location where the waste is located for pickup.
- P4.** PPE Requirements – Indicate the type of personal protective equipment is needed for the pickup / handling of the waste.
- P5.** Container Labeling Requirements – Indicate all labels to be placed on the container.
- P6.** Additional Handling Instructions – Specify any special handling or management requirements.

- P7. Waste Coordinator – Signature and badge number of the Waste Coordinator who issued the RFD to be worked. Date – date the RFD was issued.
- P8. Disposal/ Storage Completed By – Signature and badge number of the individual(s) who actually worked the RFD. Date – date the RFD was worked.
- P9. Field Supervisor – The signature and badge number of the supervisor responsible for the person(s) who worked the RFD. Date – date the supervisor signed off on the RFD.
- P10. Data Processing Completed By – Signature and badge number of the person who entered the RFD into the data system. Date – date the data entry was completed.
- P11. Waste Item Information:
- Waste Item # - Waste Identifier, usually the RFD and a hyphen with a sequential # (i.e. 104354-01)
- Container # (Barcode) – Specify the Barcode of the Container (i.e. PAD01C12345).
- Weight – Indicate the weight of the container.
- Location & Grid – Indicate where the waste was stored (i.e. C-746-A 8-02)
- Container Size – Specify the size of the container (5 gal, 55 gal, 85 gal, B90, etc.)
- P12. Operator Comments – Any comments from the field, made by the operator to the Coordinator.

WASTE ITEM/CONTAINER LOG

10. List the container # that this container log identifies and the number of containers on the RFD.
11. Waste Item ID Number - the number assigned to the waste item. Document ID Number (RFD #), with an extension to indicate drum sequence. Example XXXXX-01.
12. Origin Date - the date that the waste item was generated and/or declared a waste.

NOTE: For bulking operations, the origin date for the "newly generated waste" (the bulked waste) will be the earliest origin date noted for any of the wastes bulked.

13. RCRA Accumulation Start Date - the date when RCRA hazardous or RCRA mixed (**RCRA** and radioactive constituents) waste is moved to a 90-day **accumulation** area or directly to a permitted storage area 1) from a satellite accumulation area or 2) immediately at the time of generation (i.e., no satellite accumulation).

NOTE: For bulking operations, the RCRA Accumulation Start Date for the "newly generated waste" (the bulked waste) will be the **earliest RCRA Accumulation Start Date** noted for any of the wastes bulked.

14. PCB Date to Storage - the date a PCB item, article, or waste is removed from service for disposal. For a freestanding article or item, such as a transformer, capacitor, or ballast, this is the date that the article or item is actually removed from service for disposal. For wastes other than articles and items which are placed in a containment system, such as a drum or box, this is the date that the first drop or particle of PCB contaminated waste is placed in the containment system.

NOTE: For bulking operations, the PCB Start Date for the "newly generated waste" (the bulked waste) will be the earliest PCB Date to Storage of any of the wastes bulked.

15. Waste Material Placed in Container - a detailed list of any materials placed in the container.
16. Quantity - the amount or volume of each waste placed in the container.
17. Depositor - the initials of the person placing an item in the container and the date it was placed into the container.
18. Comments - any comments about the items that are placed into the container (such as sample #'s, spill #'s, etc.).
19. Container ID Number - the **barcoded** number placed on the outermost container for this waste. May not be placed on container until waste is placed in WM storage.
110. Absorbent Materials - indicate whether absorbent materials have been purposely added to the waste for increased stability, cushioning, or liquid absorption. Include quantity and type of material.
111. NMC&A Form - the identification number on **the** nuclear materials control and accountability form, this is required only for accountable materials/waste.
112. Est Net Vol - estimated volume of waste that is actually in the containment system; i.e., NOT the maximum volume that the containment system is designed to hold.
113. Units - indicate the units for the estimated net volume indicated in **18**; typical units are gal, liters (L), or ft³. Other volumetric units are also acceptable.

114. Gross Wt - indicate the weight of the waste and it's package, i.e., plastic bag or wrapping, can, bucket, box, etc. If weight is unknown, an estimate is acceptable. Please indicated an estimated weight by putting "approximately" before the weight.
115. Units - indicate the units for the estimated gross weight indicated in 110; typical units are pounds. Other weight units are acceptable. Volume units, i.e., those indicated in I9, are not acceptable.
116. Inner Container Type- the type of packaging that a waste is initially packaged in for containment (e.g., plastic bags, plastic wrapping, bottles, jars), as applicable.
117. Outer Container Type - the final packaging for the waste form or item (e.g., 1A1X drum, dumpsters, Roll off bin).
118. Tank Seal Number- the number of the seal placed on a tank when it is full or no additional contents will be placed into the tank.
119. Container Generator Signature- signature of the person who generated the container. Date- Date the generator signs the container as complete.

Note: If the container **is** for disposal at **NTS**, then the generator cannot be the **same** as the **depositor(s)** in section I-7. An independent verifier must sign.

ATTACHMENT A - LOW-LEVEL RADIOACTIVE WASTE FORM USER INSTRUCTIONS

NOTE: All fields must be addressed and a response provided for each field.

Document ID Number - the unique identifier applied to the Request For Disposal.

PROHIBITED ITEMS

Indicate the presence of any of these items in the waste; i.e., **MUST** check either YES or **NO** for each. If YES, either another attachment should be used, or more likely, a variance request should be submitted to the appropriate Waste Management organization to determine if the waste can be accepted even with prohibited items.

- A1. Pyrophoric Materials - solid or liquid materials which, even in small quantities and without an ignition source, can ignite spontaneously in air. Pyrophoric materials must be rendered safe by mixing them with chemically stable materials (concrete or glass for example) or must be processed to remove their hazardous properties (see Note below). Wastes that are expected to contain any metallic radionuclides are to be treated through oxidation to eliminate as much of the potential pyrophorics as possible prior to placement in a waste container. Pyrophoric forms of radionuclides can be accepted if they are limited to less than 1% by weight of the waste per container, and these should be generally dispersed in the waste.

NOTE: Pyrophorics, other than radioactive pyrophorics, must be managed as potential hazardous waste under the Resource and Conservation Recovery Act (RCRA), and therefore treatment of such pyrophorics to render them safe may require a permit. Accordingly, the RCRA compliance organization should be consulted for guidance for such pyrophorics.

- A2. Active Chelating Agents - prohibited if making up 1% or more by weight of the waste. Chelating agents mobilize fixed heavy metals and radionuclides for migration in the environment. Their presence must be limited to accommodate "no migration" requirements for radioactive waste disposal facilities. Chelating agents are typically found in many decontamination solutions. Examples of chelating agents are amine polycarboxylic acids (EDTA, DTPA), hydroxy-carboxylic acids, and polycarboxylic acids (citric acid, gluconic acid).

NOTE: The Nuclear Regulatory Commission requires generators to specify the weight percentage of chelating agents in radioactive waste, in addition to the identification of such agents.

- A3. Transuranic Waste (TRU) - without regard to form or source, alpha-emitting transuranic isotopes having an atomic number greater than 92, half-life greater than 20 years, and concentrations greater than 100 nCi/g at the time of generation/assay. The following radionuclides meet these criteria and must be considered when making TRU determinations: Am-241, Am-242m, Am-243, Bk-247, Cf-249, Cf-251, Cm-243, Cm-245, Cm-246, Cm-247, Cm-248, Cm-250, Np-237, Pu-238, Pu-239, Pu-240, Pu-242, and Pu-244.

NOTE: IF TRU Radioisotopes are Present > 100 nCi/g, then this must be checked yes and the LLW Coordinator must be contacted before acceptance.

- A4. Explosive Materials - chemical compounds that may detonate or deflagrate as a result of shock or heat; any substance or article which is designed to function by explosion (an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion.

- A5. Etiological Agents - infectious substances or pathogens; viable microorganisms or related toxins which cause or may cause disease in humans or animals; etiological agents include, but are not limited to, agents listed in Part 42, Code of Federal Regulations, Section 72.3 (42 *CFR* 72.3) by the Department of Health and Human Services, and any other agents that cause or may cause severe, disabling, or fatal disease (per 49 *CFR* 173.134). Examples of etiological agents are contaminated blood and viruses.
- A6. Ignition Sources - articles, devices, or conditions that promote or permit burning through intense heat or fire; ignition sources include lighters, matches, and electric sparks.
- A7. Free Liquids (prohibited only for SOLID LLRW; intrinsic for liquid LLRW) - liquids which readily separate from the solid portion of a waste under ambient temperature and pressure. The waste matrix should be able to pass the paint filter test as described in Test Methods for *Evaluating Solid Waste*, EPA/SW-846, in order to be considered solid LLRW.

NOTE: Liquid LLRW (e.g Wastewater) is excluded from this requirement and is the only case for which this block should be marked yes.

- A8. RCRA Waste - waste regulated by the Environmental Protection Agency (EPA) and approved States under RCRA due to being listed or having a characteristic as detailed in 40 *CFR* 261.
- A9. TSCA Waste - waste regulated by the EPA and approved States under the Toxic Substances Control Act (TSCA). TSCA regulated waste includes PCBs in concentrations equal to or exceeding 50 ppm or PCBs from sources equal to or greater than 50 ppm.

ADDITIONAL WASTE CHARACTERISTICS

- A10. Waste Variance Request Number- Enter the number(s) of any **approved** Waste Variance Request forms that apply to this waste.
- A11. Chelating Agents - chelating agents mobilize fixed heavy metals and radionuclides for migration in the environment. Their presence must be limited to accommodate "no migration" requirements for radioactive waste disposal facilities. Indicate presence of any amount of chelating agents by marking the YES box, and the absence of chelating agents by marking the NO box. Refer to **A2** for examples of chelating agents.
- A12. Ion Exchange Resins - indicate whether ion exchange resins are present in the waste by checking either YES or NO. Ion exchange resins are synthetic resins with active groups (usually sulfonic, carboxylic, phenol, or substituted amino groups) that give the resin the property of combining with or exchanging ions between the resin and a solution. Some uses of ion exchange resins include water softening, recovery of chromate from plating solutions, recovery of uranium from acid solutions, removal of formic acid from formaldehyde solutions, recovery of valuable metals from wastes, recovery and separation of radioactive isotopes from atomic fission, and chromatography.
- A13. Detectable PCBs- Indicate if the waste is <50 ppm PCB and is from a source <50 ppm PCB.
- A14. Wastewater- Indicate if a wastewater. Less than 10 % solids.

RADIOISOTOPE DETERMINATION METHOD

- RI. Analysis Sample ID# - indicate any chemical analysis performed on the waste by listing the Lab Sample

Identification number(s) in this block, and attach the analysis to the data package.

- R2. PK Form - if process knowledge is used for waste characterization, a process knowledge form must be completed prior to data package submittal. This form must be completed for each waste stream and submitted on the noted basis to the appropriate Waste Management organization. Updates must be submitted when changes in the information on the form necessitate revision. Upon completion and approval of the appropriate Waste Management organization, the form may be used for all subsequent generation of the same waste stream. The unique identification number assigned to the process knowledge form must be indicated in this block (R2) for all subsequently submitted RFD data packages for the same waste stream.
- R3. Fissile Content (Wt% of U-235) - the weight % of U-235 in material in the container. Can be determined by TIMS analysis.
- R4. Grams U-235- indicate the grams of U-235 in the material.
- R5. NCS Exempt- The material contains uranium with enrichment less than one weight % U-235 or total less than 15 grams of U-235.
- R6. Chemical Form - the chemical form of the waste must be indicated in this block. Some chemical forms meet the definition of hazardous, as defined by 40 CFR 261, or excluded material. An example of a hazardous chemical form is the elemental form of the isotopes of Cesium, Strontium, and Uranium. Elemental forms of Cesium and Strontium may be air- and/or water- reactive, and elemental forms of Uranium may be pyrophoric.

OTHER SAMPLE ANALYSIS

01. Analysis Sample ID#- list any chemical analysis, other than radioisotope data from R1, that was performed on the waste by listing the Lab Sample Identification number(s) in this block, and attach the analysis to the data package.
02. PK Form - if process knowledge is used for waste characterization, a process knowledge form must be completed prior to data package submittal. This form must be completed for each waste stream and submitted on the noted basis to the appropriate Waste Management organization. Updates must be submitted when changes in the information on the form necessitate revision. Upon completion and approval of the appropriate Waste Management organization, the form may be used for all subsequent generation of the same waste stream. The unique identification number assigned to the process knowledge form must be indicated in this block (R2) for all subsequently submitted RFD data packages for the same waste stream.

RADIATION DATA FROM HEALTH PHYSICS SURVEY

- R7. through R15. The information for this portion of the RFD is to be supplied by Health Physics. Please contact HP for support.

ATTACHMENT B - RCRA MIXED AND/OR TSCA RADIOACTIVE WASTE FORM USER INSTRUCTIONS

NOTE: This form is only to be used for those RCRA and TSCA wastes that are also radioactively contaminated.

NOTE: All fields must be addressed and a response provided for each field.

KL. Document ID Number - the unique identifier applied to the Request For Disposal.

PROHIBITED ITEMS

Indicate the presence of any of these items in the waste; i.e., MUST check either YES or NO for each. If YES, either another attachment should be used, or a variance request should be submitted to the appropriate Waste Management organization to determine if the waste can be accepted.

- BL.** Chemically Incompatible Substances - indicate the presence or absence of any substances which may chemically react with one another to create a hazard to the packagers, container, or environment. Reference document EPA-600/2-80-076, *"A Method for Determining the Compatibility of Hazardous Wastes"*

OTHER WASTE CHARACTERISTICS

- B2.** Waste Variance Request Number- Enter the number(s) of any **approved** Waste Variance Request forms that apply to this waste.
- B3.** Chelating Agents - chelating agents mobilize fixed heavy metals and radionuclides for migration in the environment. Their presence must be limited to accommodate "no migration" requirements for radioactive waste disposal facilities. Indicate presence of any amount of chelating agents by marking the YES box, and the absence of chelating agents by marking the NO box. Decontamination solutions often contain chelating agents. Examples of chelating agents are amine polycarboxylic acids (**EDTA**, **DTPA**), hydroxy-carboxylic acids, and polycarboxylic acids (citric acid, gluconic acid).
- B4.** Ion Exchange Resins - indicate whether ion exchange resins are present in the waste by checking either YES or NO. Ion exchange resins are synthetic resins with active groups (usually sulfonic, carboxylic, phenol, or substituted amino groups) that give the resin the property of combining with or exchanging ions between the resin and a solution. Some uses of ion exchange resins include water softening, recovery of chromate from plating solutions, recovery of Uranium from acid solutions, removal of formic acid from formaldehyde solutions, recovery of valuable metals from wastes, recovery and separation of radioactive isotopes from atomic fission, and chromatography.
- B5.** pH - indicate the pH of any aqueous waste as determined by using a pH meter, or other methodology as approved by the appropriate Waste Management organization.
- B6.** Corrosivity to Steel - indicate whether the waste, either liquid or solid, corrodes steel at a rate greater than or less than 6.25 mm/yr.

NOTE: This is only required for liquids if the pH is not obtained or attainable, and is required for solids to determine corrosivity characteristics per DOT regulations. Process knowledge may be used to make this determination, and the Waste Management organization will assist with this determination, as required.

- B7.** Flashpoint - indicate the flashpoint of any liquid waste stream as determined by a closed cup method such as a Pensky-Martens. Flashpoint must be indicated in deg C or deg F.

NOTE: The flashpoint should be provided by the generator if the waste is a known ignitable (D001) waste in accordance with 40 **CFR** 261.2 1(a)(1).

B8. Boiling Point - indicate the initial boiling point in terms of less than or equal to 35 deg C (95 deg F) or >35 deg C (95 deg F) of any liquid waste that has a flashpoint of 141 deg F or less.

NOTE: The boiling point should be provided by the generator if the waste is a known ignitable (D001) waste and has a flashpoint of 141 deg F or less.

B9. Detectable PCB- Indicate if the waste is from a source <50 ppm PCB.

B10. Wastewater- Indicate if a wastewater. Less than 10% solids.

B11. Radioactive - Either Yes or No

RADIOISOTOPE DETERMINATION METHOD

R1. Analysis Sample ID# - indicate any chemical analysis performed on the waste by listing the Lab Sample Identification number(s) in this block, and attach the analysis to the data package.

R2. PK Form - if process knowledge is used for waste characterization, a process knowledge form must be completed prior to data package submittal. This form must be completed for each waste stream and submitted on the noted basis to the appropriate Waste Management organization. Updates must be submitted when changes in the information on the form necessitate revision. Upon completion and approval of the appropriate Waste Management organization, the form may be used for all subsequent generation of the same waste stream. The unique identification number assigned to the process knowledge form must be indicated in this block (R2) for all subsequently submitted RFD data packages for the same waste stream.

R3. Fissile Content (Wt% of U-235) - the weight % of U-235 in material in the container. Can be determined by TIMS analysis.

R4. Grams U-235- indicate the grams of U-235 in the material.

R5. NCS Exempt- The material contains uranium with enrichment less than one weight % U-235 or total less than 15 grams U-235.

R6. Chemical Form - the chemical form of the waste must be indicated in this block. Some chemical forms meet the definition of hazardous, as defined by 40 **CFR** 261, or excluded material. An example of a hazardous chemical form is the elemental form of the isotopes of Cesium, Strontium, and Uranium. Elemental forms of cesium and strontium may be air- and/or water- reactive, and elemental forms of uranium may be pyrophoric.

RCRA/TSCA DETERMINATION METHOD

TI. Analysis Sample ID# - indicate any analysis performed on the waste by listing the Lab Sample identification number in this block, and attach the analysis to the data package.

- T2. PK Form - if process knowledge is used for waste characterization, a process knowledge form must be completed prior to data package submittal. This form must be completed for each waste stream and submitted on the noted basis to the appropriate Waste Management organization. Updates must be submitted when changes in the information on the form necessitate revision. Upon completion and approval of the appropriate Waste Management organization, the form may be used for all subsequent generation of the same waste stream. The unique identification number assigned to the process knowledge form must be indicated in this block (T2) for all subsequently submitted RFD data packages for the same waste stream.
- T3. RCRA Waste- indicate whether the waste is regulated under RCRA by checking YES or NO. RCRA wastes are those wastes either listed or exhibiting characteristics as defined in 40 CFR 261.
- T4. TSCA Waste - indicate whether the waste is regulated under TSCA by checking YES or NO. TSCA waste are those containing ≥ 50 ppm PCB or from a source ≥ 50 ppm as defined in 40 CFR 761.
- T5. Underlying Hazardous Constituent(s) Present - indicate whether any of the underlying hazardous constituents as defined in 40 CFR 268.42 and 268.48 are present in any characteristic waste (D001 - D043).
- T6. PCB Present - indicate whether PCBs are present or not. YES should be checked for any wastes having any level of PCBs.
- T7. PCB Concentration - indicate the concentration of PCBs actually present in the waste. This number may be obtained through analysis or process knowledge. Indicate this value in units of parts per million (ppm) or parts per billion (ppb).
- T8. PCB Source Concentration - indicate the largest known source of PCBs that contributed to the waste. Source values are the actual concentration of PCBs prior to any mixing, dilution, treatment, or other physical or chemical change. This value should be in ppm or ppb.
- T9. PCB Source Concentration Range (ppm) - if T8 is unknown, then the range of known or sources of PCBs in the waste must be indicated. Only one range should be indicated, and this should be the range of highest known concentration.
- T10. Known Hazardous Constituents- list any hazardous constituents known (or suspected) to be present in the waste.
- T11. Known Underlying Hazardous constituents- list any of the underlying hazardous constituents as defined in 40 CFR 268.42 and 268.48 are present in any characteristic waste (D001 - D043).

RADIATION DATA FROM HEALTH PHYSICS SURVEY

R7. through R15. The information for this portion of the RFD is to be supplied by Health Physics. Please contact HP for support.

REGULATORY CODES (TO BE COMPLETED BY WASTE MANAGEMENT)

- X1. PCB Item- code to identify the type of PCB item/ container/ article being disposed.
- X2. Waste Stream ID- The DOE-PGDP mixed-LLW Wastestreams.
- X3. Form Code- State code that identifies the form or physical state of the waste.
- X4. Source Code- State code to identify where waste originated.

- X5. Handling Code- code to describe how hazardous waste was handled. Example- treatment, storage, and disposal.
- X6. LDR Code- code for Land Disposal Restriction effective dates.
- X7. Reactivity Group Number- Code to determine compatibility.
- X8. Generated from a Non-RMMA- waste was generated from an area designated as a Non-RMMA and is not considered LLW.
- X9. Substance ID - indicate the Chemical Abstract Registry (**CAR**) number and the name of hazardous substances.
- X10. Concentration - indicate the concentration of each Substance ID listed in X9.
- X11. Units - indicate the unit of measure for each concentration reported in X9.
- X12. EPA Code(s) - indicate the 4-digit code that EPA assigns to listed and characteristic wastes. This code may start with the letters D, F, K, P, or U. The D-codes are those characteristic wastes regulated under RCRA, and the F, K, P, and U codes are those listed wastes regulated under RCRA.
- X13. Underlying Hazardous Constituent - indicate whether the substance referenced in X9 qualifies as an underlying hazardous constituent.
- X14. Substance Name- list the most common name for the substance identified in X9.
- X15. Check box if continuation sheets are needed to list **all** applicable constituents of the waste, and indicate how many Constituent Continuation Sheets are attached. **All** known constituents must be identified.

ATTACHMENT C -SANITARY WASTE, LANDFILL WASTE, OR NON-REGULATED WATER FORM USER INSTRUCTIONS

NOTE: All fields must be addressed and a response provided for each field.

Document ID Number - the unique identifier applied to the Request for Disposal.

PROHIBITED ITEMS

Indicate the presence of any of these items in the waste; i.e. **MUST** check either YES or NO for each. If YES, either another attachment should be used, or a variance request should be submitted to the appropriate Waste Management organization to determine if the waste can be accepted.

- C1. RCRA Waste - waste regulated by the Environmental Protection Agency (EPA) and approved States under RCRA due to being listed or having a characteristic as detailed in 40 **CFR** 26.1.
- c2. TSCA Waste - waste regulated by the EPA and approved States under the Toxic Substances Control Act (TSCA). TSCA regulated waste includes PCBs in concentrations equal to or exceeding 50 ppm or PCBs from sources equal to or greater than 50 ppm.
- c3. LLRW- waste that has a total Uranium concentration >30 pCi/g
- c4. Free Liquids - liquids which readily separate from the solid portion of a waste under ambient temperature and pressure. The waste matrix should be able to pass the paint filter test as described in *Test Methods for Evaluating Solid Waste*, EPA/SW-846, in order to be considered solid LLW.
- C5. Detectable PCB- Indicate if the waste is from a source <50 ppm PCB.
- C6. Waste Variance Request Number- Enter the number(s) of any **approved** Waste Variance Request forms that apply to this waste.

RADIOISOTOPE DETERMINATION MET

- RI. Analysis Sample ID# - indicate any chemical analysis performed on the waste by listing the Lab Sample Identification number(s) in this block, and attach the analysis to the data package.
- R2. PK Form - if process knowledge is used for waste characterization, a process knowledge form must be completed prior to data package submittal. This form must be completed for each waste stream and submitted on the noted basis to the appropriate Waste Management organization. Updates must be submitted when changes in the information on the form necessitate revision. Upon completion and approval of the appropriate Waste Management organization, the form may be used for all subsequent generation of the same waste stream. The unique identification number assigned to the process knowledge form must be indicated in this block (R3) for all subsequently submitted RFD data packages for the same waste stream.

OTHER SAMPLE ANALYSIS

01. Analysis Sample ID#- List any chemical analysis, other than rad data from R1, that was performed on the waste by listing the Lab Sample Identification number(s) in this block, and attach the analysis to the data package.
02. **PK Form** - if process knowledge is used for waste characterization, a process knowledge form must be completed prior to data package submittal. This form must be completed for each waste stream and submitted on the noted basis to the appropriate Waste Management organization. Updates must be submitted when changes in the information on the form necessitate revision. Upon completion and approval of the appropriate Waste Management organization, the form may be used for all subsequent generation of the same waste stream. The unique identification number assigned to the process knowledge form must be indicated in **this block (R3)** for all subsequently submitted **RFD** data packages for the same waste stream.

RADIATION DATA FROM HEALTH PHYSICS SURVEY

- R8. through R15. The information for this portion of the RFD is to be supplied by Heath Physics. Please contact HP for support.

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APPENDIX J

Process Knowledge Form (UCN-20701)

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INSTRUCTIONS

waste stream. PK can be an effective tool for characterization of wastes in those cases where other methods, such as sampling UCN-20701 shall information that may

Sampling results of the process, procurement specifications, vendor data (including hazardous materials analytical results), material balance and concentration calculations, analytical results from similar processes, results from laboratory or pilot studies (e.g., treatability studies) and administrative/procedural controls.

NOTE: Direct any questions on completion, submittal, or use of this form to the Site Operations.

1. Complete all sections of this form (UCN-20701) to document PK and sign. Complete one UCN-20701 form for **EACH** separate waste category (i.e., complete one for LLW, one for RCRA/TSCA, etc.).
 2. Enter "N/A" in sections of this form that are not applicable.
- is available on the UCN-20701
UCN-20701 form to Site Operations.

RFD NUMBER OR UCN-20700

SECTION A: PROCESS AREA

1. BUILDING/AREA

NAME/TITLE OF PERSON COMPLETING THIS FORM

2. DESCRIBE (IN DETAIL) THE PROCESS/ACTIVITY CONDUCTED IN THIS AREA

3. WHICH OF THE FOLLOWING WASTE CATEGORIES ARE GENERATED IN THE PROCESS/ACTIVITY AREA?

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> LLW | <input type="checkbox"/> RCRA/TSCA MIXED |
| <input type="checkbox"/> WASTEWATER | <input checked="" type="checkbox"/> TRU/TRU MIXED |

SECTION B: WASTE CATEGORY AND WASTE STREAM INFORMATION

1. FOR WHICH WASTE CATEGORY IS THE PROCESS KNOWLEDGE DOCUMENTED HEREIN TO BE USED? (CHECK ONLY ONE PER FORM.)

- | | | |
|-------------------------------------|--|------------------------------------|
| <input type="checkbox"/> LLW | <input type="checkbox"/> RCRA/TSCA MIXED | <input type="checkbox"/> RCRA/TSCA |
| <input type="checkbox"/> WASTEWATER | <input type="checkbox"/> TRU/TRU MIXED | |

2. PROVIDE A BRIEF DESCRIPTION OF THE WASTE STREAM(S) WITHIN THE CATEGORY IDENTIFIED IN B.1 FOR WHICH THIS PROCESS KNOWLEDGE APPLIES.

SECTION C: RADIOACTIVE CONSTITUENTS

1. IF PK IS USED TO DEMONSTRATE THE ABSENCE OF RADIOACTIVE CONSTITUENTS, THEN LIST AND PROVIDE ALL DOCUMENTS, PROCEDURES, REPORTS, AND SUPPORTING EVIDENCE WHICH JUSTIFIES THE USE OF PK.

2. IF PK IS USED TO DEMONSTRATE THE PRESENCE OF OR TO QUANTIFY THE RADIOACTIVE CONSTITUENTS, THEN LIST ALL ISOTOPES AND DESCRIBE THE METHODOLOGIES USED TO MAKE THESE DETERMINATIONS. IN ADDITION, LIST AND PROVIDE ALL DOCUMENTS, PROCEDURES, REPORTS AND SUPPORTING EVIDENCE WHICH JUSTIFIES THE USE OF PK.

SECTION D: REGULATED (RCRA/TSCA) HAZARDOUS CONSTITUENTS

1. IF PK IS USED TO DEMONSTRATE THE ABSENCE OF RCRA/TSCA CONSTITUENTS, THEN LIST AND PROVIDE ALL DOCUMENTS, PROCEDURES, REPORTS, AND SUPPORTING EVIDENCE WHICH JUSTIFIES THE USE OF PK.

2. IF PK IS USED TO DEMONSTRATE THE PRESENCE OF OR TO QUANTIFY RCRA/TSCA CONSTITUENTS OR DETERMINE EPA WASTE CODES, DESCRIBE THE METHODOLOGIES USED TO MAKE THESE DETERMINATIONS. IN ADDITION, LIST AND PROVIDE ALL DOCUMENTS, PROCEDURES, REPORTS, AND SUPPORTING EVIDENCE WHICH JUSTIFIES THE USE OF PK.

SECTION E: OTHER WAC PARAMETER DETERMINATION

1. DESCRIBE THE METHOD USED TO DEMONSTRATE THE PRESENCE OR ABSENCE OF OR TO QUANTIFY OTHER WAC PARAMETERS. IN ADDITION, LIST AND PROVIDE ALL DOCUMENTS, PROCEDURES, REPORTS, AND SUPPORTING EVIDENCE WHICH JUSTIFIES THE USE OF PK.

PRINTED NAME

SIGNATURE

BADGE NUMBER

DATE

APPENDIX K

Waste Variance Form (UCN-20702)

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WASTE VARIANCE REQUEST

FORM UCN-20702

NUMBER

Nº

0354

INSTRUCTIONS

In some cases, a generator may be unable to meet certain certification-related requirements. A variance may be granted if it is determined that conditions exist which make it exceedingly difficult or impossible to meet a requirement or if it is determined that the compliance status of either the generator or Site Operations is not compromised by the variance. Variances will not be granted due to convenience, and all requests must be thoroughly documented by the generator.

GENERATOR ACTIONS

NOTE: Direct any questions on completion, submittal, or use of this form to Site Operations.

1. Complete all sections on the front page of UCN-20702, and sign at the bottom.
2. Submit completed form UCN-20702 to Site Operations.
3. Sign *approved* request. (Note that denied variance requests do not require the generator's signature.)

TO BE COMPLETED BY REQUESTER		
NAME	BADGE NUMBER	PHONE
ADDRESS	DIVISION	DEPARTMENT
DESCRIBE (IN DETAIL) THE SITUATION OR PROCESS IN WHICH THE WASTE WAS GENERATED.		
SPECIFY THE REQUIREMENT(S) WHICH CANNOT BE MET AND PROVIDE (IN DETAIL) THE REASON(S) WHY.		
FOR WHAT PERIOD OF TIME IS THE VARIANCE REQUESTED?		
WHAT ACTIONS WILL BE TAKEN TO BRING THE WASTE AND/OR THE PROGRAM INTO FULL COMPLIANCE (PROVIDE A SCHEDULE.)		
REQUESTER SIGNATURE	DATE	

VARIANCE REQUEST NUMBER

REVIEWED BY (PRINT NAME)

REVIEWED BY (SIGNATURE)

DATE REVIEW COMPLETED

IS THIS VARIANCE REQUEST A CONTINUATION OF AN EXISTING REQUEST? IF SO, IS THERE ENOUGH JUSTIFICATION FOR CONTINUANCE?

VARIANCE IS GRANTED. THE FOLLOWING CONDITIONS APPLY.

VARIANCE EXPIRATION DATE

VARIANCE IS DENIED. THE FOLLOWING CONDITIONS APPLY.

PRINTED NAME

SIGNATURE

BADGE NUMBER

DATE

WASTE COORDINATOR

PRINTED NAME

SIGNATURE

BADGE NUMBER

DATE

FACILITY OPERATOR

PRINTED NAME

SIGNATURE

BADGE NUMBER

DATE

FACILITY OWNER

PRINTED NAME

SIGNATURE

BADGE NUMBER

DATE

REQUESTER (REQUIRED ONLY IF VARIANCE IS APPROVED)

APPENDIX L
Underlying Hazardous Constituents

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ATTACHMENT 2
TREATMENT STANDARDS FOR UNDERLYING HAZARDOUS CONSTITUENTS FOR D001-D043 CHARACTERISTIC
CODES AND F039 MULTI-SOURCE LEACHATE

GENERATOR: U.S.DOE/ BIC

EPA I.D. NO.: KY8-890-008-982

Circle ALL hazardous constituents which are expected to be present.

Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)	Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)
A2213*	1.4	0.042	Bromodichloromethane	15	0.35
Acenaphthylene	3.4	0.059	Bromomethane (methyl bromide)	15	0.11
Acenaphthene	3.4	0.059	4-Bromophenyl phenyl ether	15	0.055
Acetone	160	0.28	n-Butyl alcohol	2.6	5.6
Acetonitrile	38	5.6	Butylate*	1.4	0.042
Acetophenone	9.7	0.010	Butyl benzyl phthalate	28	0.017
2-Acetylaminofluorene	140	0.059	2-sec-Butyl-4,6-dinitrophenol(Dinoseb)	2.5	0.066
Acrolein	NA	0.29	Carbaryl*	0.14	0.006
Acrylamide	23	19	Carbenzadim*	1.4	0.56
Acrylonitrile	84	0.24	Carbofuran*	0.14	0.006
Aldicarb sulfone*	0.28	0.056	Carbofuran phenol*	1.4	0.056
Aldrin	0.066	0.021	Carbon disulfide	4.8mg/l TCLP	3.8
4-Aminobiphenyl	NA	0.13	Carbon tetrachloride	6	0.057
Aniline	14	0.81	Carbosulfan*	1.4	0.028
Anthracene	3.4	0.059	Chlordane(alpha and gamma isomers)	0.26	0.0033
Aramite	NA	0.36	p-Chloroaniline	16	0.46
alpha-BHC	0.066	0.00014	Chlorobenzene	6.0	0.057
beta-BHC	0.066	0.00014	Chlorobenzilate	NA	0.10
delta-BHC	0.066	0.023	2-Chloro-1,3-butadiene	0.28	0.057
gamma-BHC	0.066	0.0017	Chlorodibromomethane	15	0.057
Barban*	1.4	0.056	Chloroethane	6.0	0.27
Bendiocarb*	1.4	0.056	bis(2-Chloroethoxy) methane	7.2	0.036
Bendiocarb phenol*	1.4	0.056	bis-(2-Chloroethyl) ether	6.0	0.033
Benomyl*	1.4	0.056	Chloroform	6.0	0.046
Benzene	10	0.14	bis(2-Chloroisopropyl) ether	7.2	0.055
Benz(a)anthracene	3.4	0.059	p-Chloro-m-cresol	14	0.018
Benzal chloride	6.0	0.055	2-Chloroethyl vinyl ether	NA	0.062
Benzo(b)fluoranthene	6.8	0.11	Chloromethane (Methyl Chloride)	30	0.19
Benzo(k)fluoranthene					
Benzo(g,h,i)perylene					
Benzo(a)pyrene					

Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)	Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)
Chrysene	3.4	0.059	1,2-Dichloropropane	18	0.85
o-Cresol	5.6	0.11	cis-1,3-Dichloropropene	18	0.036
m-Cresol	5.6	0.77	trans-1,3-Dichloropropene	18	0.036
p-Cresol	5.6	0.77	Dieldrin	0.13	0.017
m-Cumenyl methylcarbamate*	1.4	0.056	Diethylene glycol, dicarbamate*	1.4	0.056
Cyclohexanone	0.75 mg/l TCLP	0.36	Diethyl phthalate	28	0.20
o,p'-DDD	0.087	0.023	p-Dimethylaminoazobenzene	NA	0.13
p,p'-DDD	0.087	0.023	2,4-Dimethyl phenol	14	0.036
o,p'-DDE	0.087	0.031	Dimethyl phthalate	28	0.047
p,p'-DDE	0.087	0.031	Dimetilan*	1.4	0.056
o,p'-DDT	0.087	0.0039	Di-n-butyl phthalate	28	0.057
p,p'-DDT	0.087	0.0039	1,4-Dinitrobenzene	2.3	0.32
Dibenz(a,h)anthracene	8.2	0.055	4,6-Dinitro-o-cresol	160	0.28
Dibenzo(a,e)pyrene	NA	0.061	2,4-Dinitrophenol	160	0.12
1,2-Dibromo-3-chloropropane	15	0.11	2,4-Dinitrotoluene	140	0.32
Ethylene dibromide (1,2-Dibromoethane)	15	0.028	2,6-Dinitrotoluene	28	0.55
Dibromomethane	15	0.11	Di-n-octyl phthalate	28	0.017
m-Dichlorobenzene	6.0	0.036	Di-n-propylnitrosoamine	14	0.40
o-Dichlorobenzene	6.0	0.088	1,4-Dioxane	170	12.0
p-Dichlorobenzene	6.0	0.090	Diphenylamine	13	0.92
Dichlorodifluoromethane	7.2	0.23	Diphenylnitrosamine	13	0.92
1,1-Dichloroethane	6.0	0.059	1,2-Diphenyl hydrazine	NA	0.087
1,2-Dichloroethane	6.0	0.21	Disulfoton	6.2	0.017
1,1-Dichloroethylene	6.0	0.025	Dithiocarbamates (total)*	28	0.028
trans-1,2-Dichloroethylene	30	0.054	Endosulfan I	0.066	0.023
2,4-Dichlorophenol	14	0.044	Endosulfan II	0.13	0.029
2,6-Dichlorophenol	14	0.044	Endosulfan sulfate	0.13	0.029
2,4-D (2,4-Dichlorophenoxyacetic acid)	10	0.72	Endrin	0.13	0.0028

Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)	Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)
Endrin aldehyde	0.13	0.025	Isobutanol (Isobutyl alcohol)	170	5.6
EPTC*	1.4	0.042	Isodrin	0.066	0.021
Ethyl acetate	33	0.34	Isolan*	1.4	0.056
Ethyl benzene	10	0.057	Isosafrole	2.6	0.081
Ethyl cyanide (Propanenitrile)	360	0.24	Kepone	0.13	0.0011
Ethyl ether	160	0.12	Methacrylonitrile	84	0.24
bis(2-Ethylhexyl) phthalate	28	0.28	Methanol	0.75 mg/l TCLP	5.6
Ethyl methacrylate	160	0.14	Methapyrilene	1.5	0.081
Ethylene oxide	NA	0.12	Methoicarb*	1.4	0.056
Famphur	15	0.017	Methomyl*	0.14	0.028
Fluoranthene	3.4	0.068	Methoxychlor	0.18	0.25
Fluorene	3.4	0.059	3-Methylcholanthrene	15	0.0055
Formetanate hydrochloride*	1.4	0.056	4,4-Methylene-bis-(2-chloroaniline)	30	0.50
Formparanate*	1.4	0.056	Methylene chloride	30	0.089
Heptachlor	0.066	0.0012	Methyl ethyl ketone	36	0.28
Heptachlor epoxide	0.066	0.016	Methyl isobutyl ketone	33	0.14
Hexachlorobenzene	10	0.055	Methyl methacrylate	160	0.14
Hexachlorobutadiene	5.6	0.055	Methyl methansulfonate	NA	0.018
Hexachlorocyclopentadiene	2.4	0.057	Methyl parathion	4.6	0.014
Hexachlorodibenzo-p-dioxins (HxCDDs)	0.001	0.000063	Metolcarb*	1.4	0.056
Hexachlorodibenzo-furans (HxCDFs)	0.001	0.000063	Mexacarbate*	1.4	0.056
Hexachloroethane	30	0.055	Molinate*	1.4	0.042
Hexachloropropylene	30	0.035	Naphthalene	5.6	0.059
Indeno(1,2,3-c,d)pyrene	3.4	0.0055	2-Naphthylamine	NA	0.52
Lodmethane	65	0.19	o-Nitrolanilme	14	0.27

Circle ALL hazardous constituents which are expected to be present.

Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)	Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)
p-Nitroaniline	28	0.028	Physostigmine salicylate*	1.4	3.056
Nitrobenzene	14	0.068	Promecarb*	1.4	0.056
5-Nitro-o-toluidine	28	0.32	Pronamide	1.5	0.093

p-Nitrophenol	29	0.12	Propoxur*	1.4	0.056
N-Nitrosodiethylamine	28	0.40	Prosulfocarb*	1.4	0.042
N-Nitrosodimethylamine	2.3	3.40	Pyrene	8.2	0.067
N-Nitroso-di-n-butylamine	17	0.40	Pyridine	16	0.014
N-Nitrosomethylethylamine	2.3	0.40	Safrole	22	0.08
N-Nitrosomorpholine	2.3	0.40	Silvex (2,4,5-TP)	7.9	0.72
N-Nitrosopiperidine	35	0.013	1,2,4,5-Tetrachlorobenzene	14	0.055
N-Nitrosopyrrolidine	35	0.013	Tetrachlorodi-benzo-p-dioxins	0.001	0.000063
Oxamyl*	0.28	0.056	Tetrachlorodibenzofurans	0.001	0.000063
Parathion	4.6	0.014	1, 1, 1, 2-Tetrachloroethane	6.0	0.057
Total PCBs	10	0.10	1, 1, 2, 2-Tetrachloroethane	6.0	0.057
Pebulate*	1.4	0.042	Tetrachloroethylene	6.0	0.056
Pentachlorobenzene	10	0.055	2,3,4,6-Tetrachlorophenol	7.4	0.030
Pentachlorodibenzo-p-dioxans	0.001	0.000063	Thiodicarb*	1.4	0.019
Pentachlorodibenzo-furans	0.001	0.000035	Thiophanate-methyl*	1.4	0.056
Pentachloroethane	6.0	0.055	Tirpate*	1.4	0.042
Pentachloronitrobenzene	4.8	0.055	Toluene	10	0.080
Pentachlorophenol	7.4	0.089	Toxaphene	2.6	0.0095
Phenacetin	16	0.081	Triallate*	1.4	0.042
Phenanthrene	5.6	0.059	Bromoform (Tribromomethane)	15	0.63
Phenol	6.2	0.039	2,4,6-Tribromophenol	7.4	0.035
o-Phenylenediamine*	5.6	0.056	1,2,4-Trichlorobenzene	19	0.055
Phorate	4.6	0.021	1,1,1-Trichloroethane	6	0.054
Phthalic acid	28	3.055	1,1,2-Trichloroethane	6.0	0.054
Phthalic anhydride	28	0.055	Trichloroethylene	6.0	0.054
Physostigmine*	1.4	0.056	Trichloromonofluoromethane	30	0.020

ATTACHMENT 2 -(Continued)
TREATMENT STANDARDS FOR UNDERLYING **HAZARDOUS** CONSTITUENTS FOR D001-D043 CHARACTERISTIC
CODES AND F039 MULTI-SOURCE LEACHATE
GENERATOR: U.S. DOE/WESKEM, LLC EPA I.D. NO.: KY8-890-008-982

Circle ALL hazardous constituents, which are expected to be present.

Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)	Regulated Constituent	Nonwastewater total composition (mg/kg)	Wastewater total composition (mg/L)
2,4,5-Trichlorophenol	7.4	0.18	Chromium (Total)	0.60 mg/l TCLP	2.77
2,4,6-Trichlorophenol	7.4	0.035	Cyanides (Total)	590	1.2
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	7.9	0.72	Cyanides (amenable)	30	0.86
1,2,3-Trichloropropane	30	0.85	Fluoride ¹	NA	35
1,1,2-Trichloro-1,2,2-trifluoroethane	30	0.057	Lead	0.37 mg/l TCLP ¹	0.69
Triethylamine*	1.5	0.081	Mercury-Nonwastewater from Retort	0.20 mg/l TCLP	NA
tris(2,3-Dibromopropyl) phosphate	0.10	0.11	Mercury-All others	0.025 mg/l TCLP	0.15
Vernolate*	1.4	0.042	Nickel	5.0 mg/l TCLP ¹	3.98
Vinyl chloride	6.0	0.27	Selenium	0.16 mg/l TCLP ¹	0.82
Xylene(s)	30	0.32	Silver	0.14 mg/l TCLP	0.43
Antimony	1.15 mg/l TCLP	1.9	Sulfide ¹	NA	14
Arsenic	5.0 mg/l TCLP	1.4 ¹	Thallium	0.078 mg/l TCLP ¹	1.4
Barium	7.6 mg/l TCLP ¹	1.2	Vanadium ²	0.23 mg/l TCLP ¹	4.3
Beryllium	0.014 mg/l TCLP ¹	0.82	Zinc ¹	4.3 mg/l TCLP	2.61
Cadmium	0.11 mg/l TCLP	0.69			

* Between August 26, 1996 and August 27, 1997, these constituents are not "underlying hazardous constituents" as defined at Sec. 268.2(f)

¹ Standard is stricter than corresponding U.S. EPA limit

² These constituents are not "underlying hazardous constituents" in characteristic wastes, according to the definition.

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APPENDIX M

Landfill Certification Package Flowchart

Landfill Approval Request

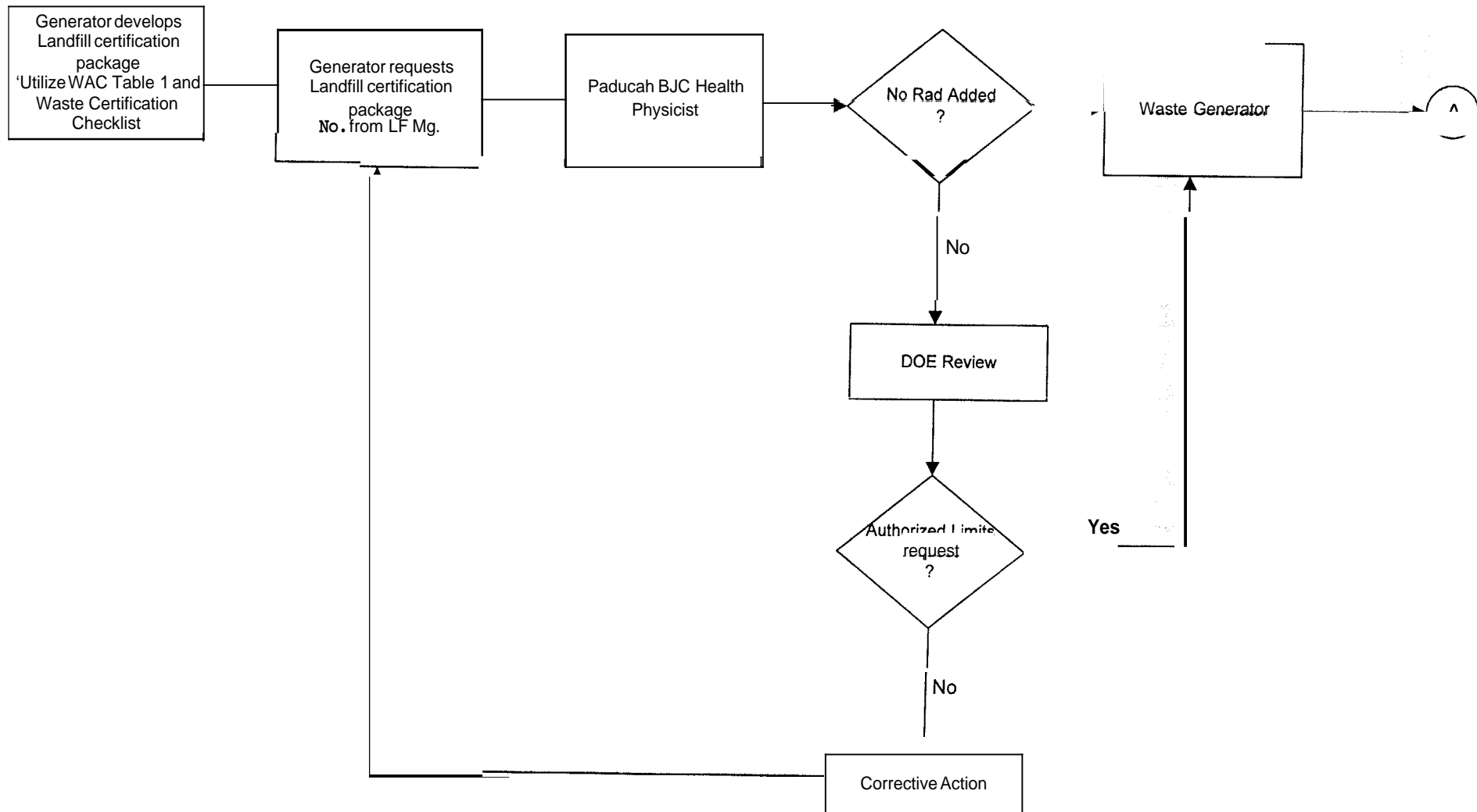
Landfill Master Disposal Log Sheet

Landfill Certification Package Checklist

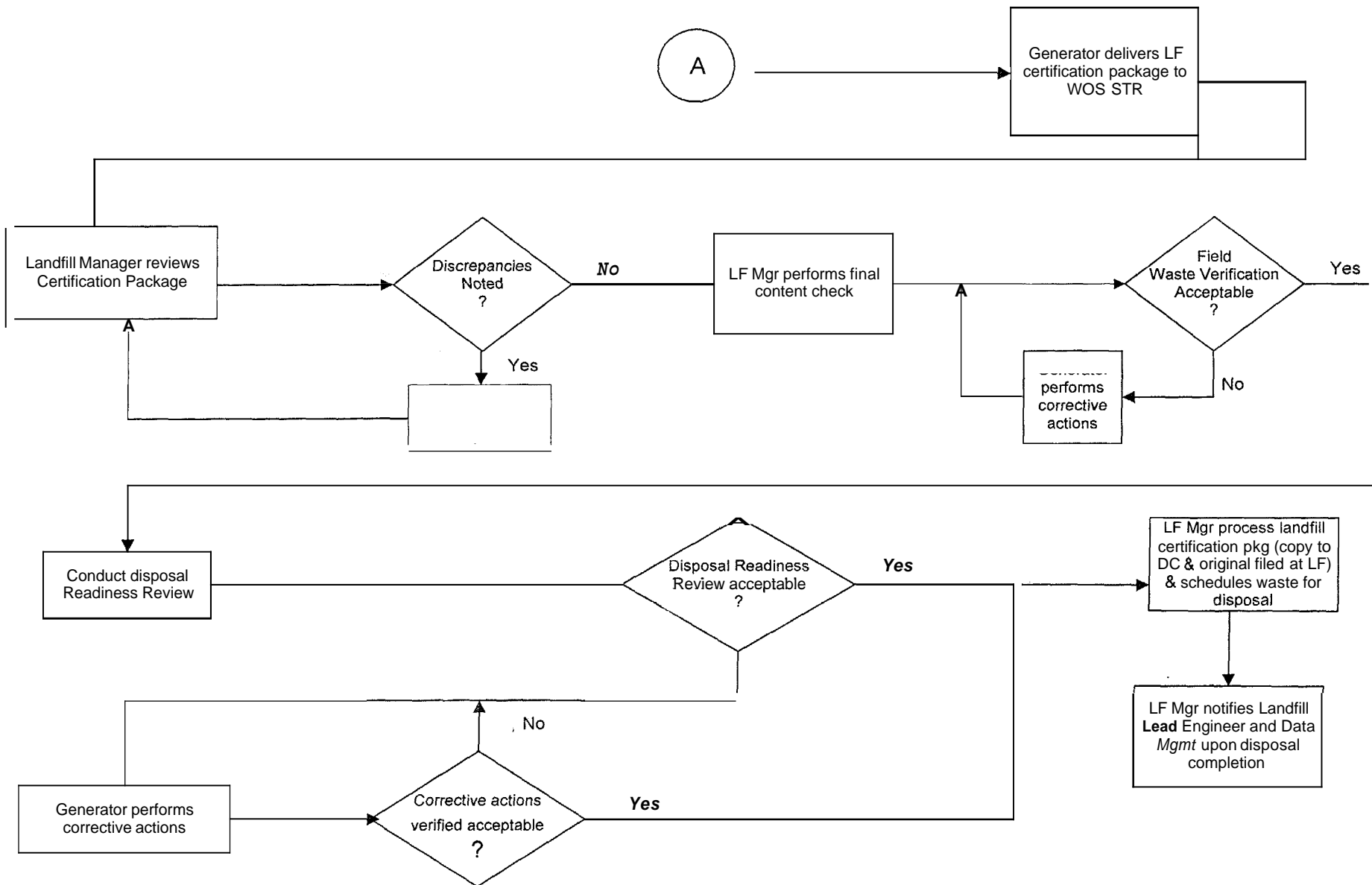
Landfill Acceptance Review

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Landfill Certification Package Flowchart for Paducah Project Waste Streams



Landfill Certification Package Flowchart for Paducah Project Waste Streams



LANDFILL WASTE APPROVAL REQUEST

Note: Direct any questions on completion, submittal, or use of this form to the Landfill Manager.

Prepared by: _____

Telephone Number: _____ Date: _____

WASTE GENERATION

Start Date: _____ Completion Date: _____

Project Name: _____

Task Leader/Project Manager: _____

PROJECT DESCRIPTION

Location (site): _____

Process which generated waste: _____

WASTE STREAM INFORMATION

For each wastestream, complete the following: (attach additional pages as needed)

Component/media: _____

Approximate Volume: _____ Approximate Weight: _____

Number and Type of Containers: _____

Component/media: _____

Approximate Volume: _____ Approximate Weight: _____

Number and Type of Containers: _____

Component/media: _____

Approximate Volume: _____ Approximate Weight: _____

Number and Type of Containers: _____

SUPPORTING DOCUMENTATION - ATTACHMENTS

WGP Attached?

RFD Attached?

PK. Form and Supporting Documentation Attached?

Analytical Data Attached?

Yes No N/A

COMMENTS

CERTIFICATION STATEMENT

I have personally reviewed the information submitted on this form **and** in all attached supporting documentation. I certify to the best of my knowledge that the information is true, accurate, **and** complete, and that the waste meets the **C-746-U WAC**.

Waste Generator

Date

RCRA

I have reviewed the analytical results and/or process knowledge documentation and agree that no regulatory thresholds have been exceeded and the waste is not a listed waste 401 JSAR Chapters 30-39.

Comments: _____

ESH Representative Signature

Date

CERCLA

I have reviewed the documentation and agree that the evidence presented that the waste

Is CERCLA Waste : _____

Is not CERCLA Waste: _____

ESH Representative Signature

Date

TSCA

I have reviewed the analytical results and/or process knowledge documentation and agree that no regulatory thresholds have been exceeded.

Comments: _____

ESH Representative Signature

Date

RADIOACTIVE MATERIALS

I have reviewed the analytical results and/or process knowledge documentation and agree that the C-746-U Solid Waste Landfill WAC for radioactive materials has been met.

Comments: _____

ESH Representative Signature

Date

QUALITY

I have reviewed the documentation and agree that the evidence presented is adequate to determine that the C-746-U Solid Waste Landfill WAC has been met.

Comments: _____

Performance Quality Assurance Representative Signature

Date

PAGE — OF —

M-6

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Landfill Certification Package Checklist

Wastestream: _____ Package No.: _____

Verified * by (initials)	File Item	Comments
<u>SECTION I</u>		
_____	Waste Generation Plan	
_____	Authorized Limits, if required	
<u>SECTION II</u>		
_____	Waste Management Plan	
_____	Landfill Waste Approval Request	
_____	Landfill Acceptance Review	
_____	Generator Compliance Acceptance/Review	
<u>SECTION III</u>		
_____	Request For Disposal	
_____	Container Log Sheets	
_____	WAC Attachment C	
<u>SECTION IV</u>		
_____	SAP [analytes, analytical methods, sampling approach (random, etc), sampling methods, sampling location (drum numbers, locations on piled bulk material, etc.), QC samples (blanks, duplicates, etc.), planned confidence level, if applicable].	
_____	Radiological Survey Plan for greater than 30 M ³	
<u>SECTION V</u>		
_____	Analytical data summary table. All data shall be in OREIS.	
_____	OREIS data summary report, if required	
_____	Statistical evaluation of analytical data required for Authorized Limits	
<u>SECTION VI</u>		
_____	Analytical data reports.	
<u>SECTION VII</u>		
_____	Regulatory documentation, if applicable (certification, state notices, etc).	
<u>Section VIII</u>		
_____	Master Landfill Disposal Log Sheet	
<u>SECTION IX</u>		
_____	Process Knowledge documentation	
Generator Signature _____		Date _____

* **Shaded areas** to be completed by Landfill personnel only.
 Note: Generator must fill in all blanks with a check or **N/A**

LANDFILL ACCEPTANCE REVIEW

Waste Stream:

Package Number:

Date Review Initiated:

REVIEW TYPE	ELEMENT	IS ELEMENT ADEQUATE?	REVIEWED BY	COMMENTS
DATA REVIEW - CONTAMINANTS OF CONCERN: RCRA Elements				
Characterization Rationale				
	Is the data consistent with the historical/process knowledge presented			
	Is the data provided consistent with the parameters and frequency in the SAP?			
	Can the data be traced to the drums/location/waste?			
Quality				
	Are QA/QC elements of the sampling/analytical event adequate?			
	Are the correct analytical methods used?			
Statistical Evaluation				
	Are the number of samples justified based on the results?			
	Are the variations among the measurements explainable?			
	Is the upper limit of the confidence interval less than the regulatory threshold?			
Additional Comments				

(GENERATOR CERTIFICATION REVIEW, continued)

Waste Stream:

Package Number:

Date Review Initiated:

REVIEW TYPE	ELEMENT	IS ELEMENT ADEQUATE?	REVIEWED BY	COMMENTS
DATA REVIEW - CONTAMINANTS OF CONCERN: TSCA Elements				
	Are QA/QC elements of the sampling/analytical event adequate?			
	Are the correct analytical methods used?			
	Are the number of samples justified based on the results?			
	Are the variations among the measurements explainable?			
	Is the upper limit of the confidence interval less than the regulatory threshold?			

(GENERATORCERTIFICATIONREVIEW, continued)

Waste Stream:

Package Number:

Date Review Initiated:

REVIEW TYPE	ELEMENT	IS ELEMENT ADEQUATE?	REVIEWED <i>BY</i>	COMMENTS
DATA REVIEW - CONTAMINANTS OF CONCERN: Radioactivity				
Characterization Rationale				
	Is the data consistent with the historical/process knowledge presented			
	Is the data provided consistent with the parameters and frequency in the SAP?			
	Can the data be traced to the drums/location/waste?			
Quality				
	Are QA/QC elements of the sampling/analytical event adequate?			
	Are the correct analytical methods used?			
Statistical Evaluation				
	Are the number of samples justified based on the results'?			
	Are the variations among the measurements explainable?			
	Is the upper limit of the confidence interval less than the regulatory threshold?			
Additional Comments				

(GENERATOR CERTIFICATION REVIEW, continued)

Waste Stream:
Initiated:

Package Number:

Date Review

REVIEW TYPE	ELEMENT	IS ELEMENT ADEQUATE?	REVIEWED BY	COMMENTS
Miscellaneous				
Characterization Rationale				
	Is the historical/process knowledge traceable to the waste generation?			
	Is the SAP/sampling description detail adequate?			
Physical Characteristics				
	Are appropriate packaging requirements specified?			
	Have free liquids been addressed?			
Additional Comments				

**DETERMINATION OF SOURCE
FOR
WASTES PROPOSED FOR DISPOSAL
IN THE
C-746-U CONTAINED LANDFILL**

LANDFILL CERTIFICATION PACKAGE _____

I have reviewed the above landfill certification package and have determined that the source **of** the waste

_____ is

_____ **is** not

a radiological material management area.

Signature of BJC Project Health Physicist

Date

DISTRIBUTION

Bechtel Jacobs Company LLC

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CDM Federal

J. J. Tarantino (five copies)

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PWT

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SAIC

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